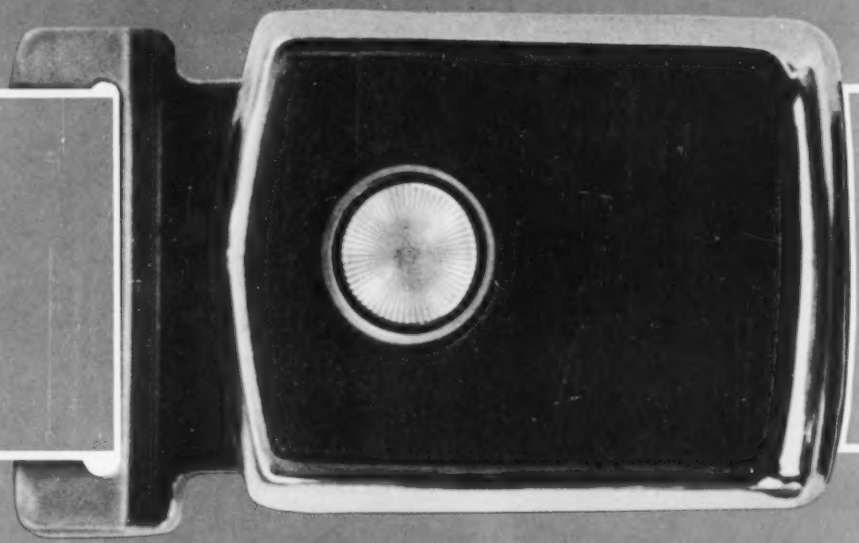
DRiVER

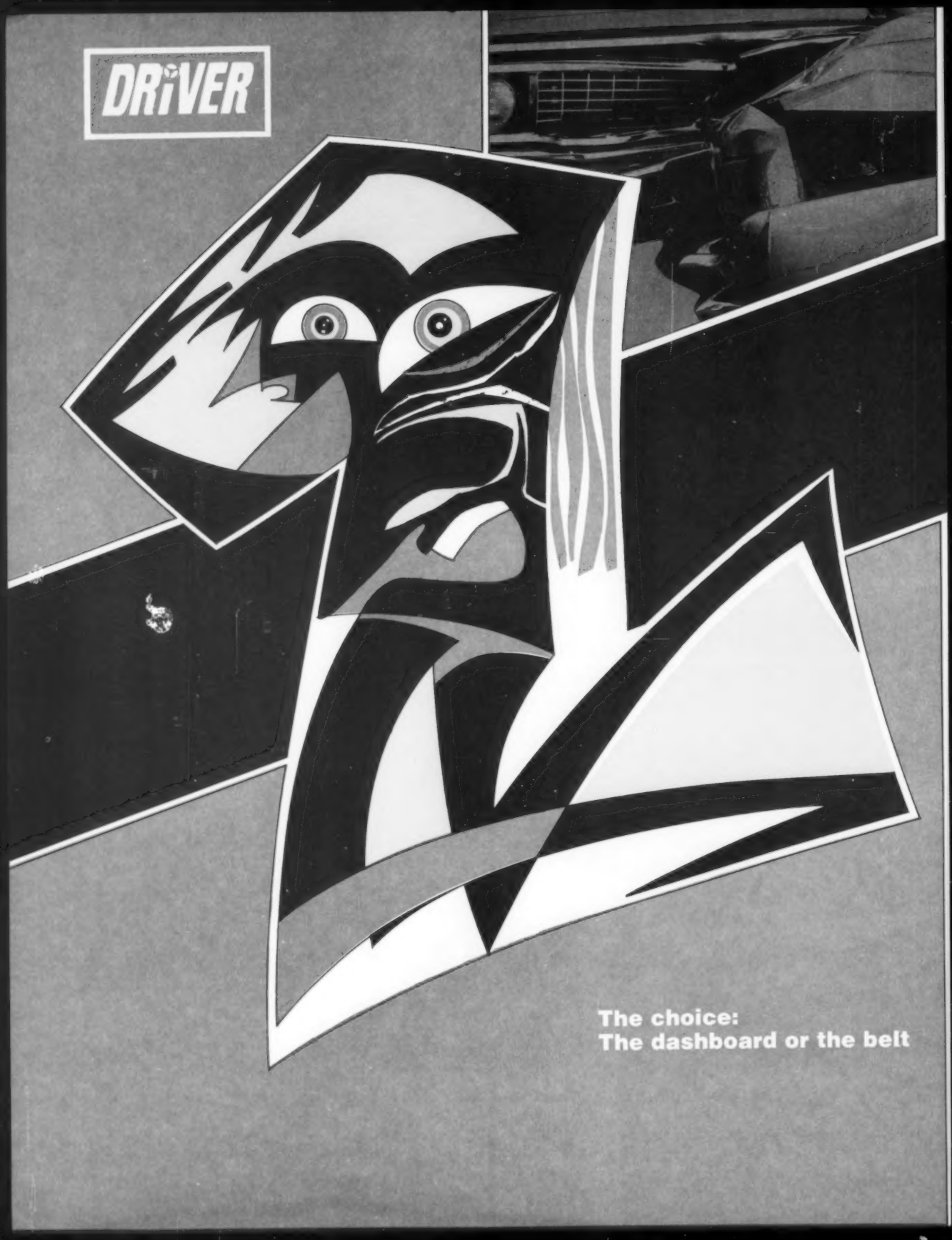
AUGUST 1980

COMMENTARY
PASSING FANCY
ONE DARK NIGHT

the second collision



PRO goes back to school


DRiVER
The choice:
The dashboard or the belt

the second collision

Every accident, even a simple one-car-against-a-signpost accident, is a multiple collision. The car smashes against the sign and a split second later the occupant hits the steering wheel and the dashboard. This "second collision" is the one that causes the injuries.

There is always a second collision. It is caused by a physical law called *inertia*, which states that an object will keep moving in a straight line until something stops it. When you turn a corner in your car, your body leans in the direction you were going before the turn. When you stop your car suddenly, your body snaps forward, attempting to continue the car's motion.

When the car's sudden turn or stop is caused by a collision (the "first collision"), your body continues this motion until it collides with something – the steering wheel, the windshield, or other parts of the car (the "second collision").

Or the seatbelt. The seatbelt is another part of the car your body might collide with, if you're buckled in. That is its purpose: to provide something for the body to hit, to absorb the shock of the sudden deceleration, to spread the force of the collision over the body parts that can most easily take it.

The human body can take a lot of stress if the stress is spread over a wide area. A large amount of force applied to a small area is what causes severe injuries or death, and this is the case in the auto accident involving the unrestrained person. His head or chest strikes a car interior part at one spot and that spot must take the full force of the impact. In contrast, the belted-in occupant has the force spread over his whole chest and his abdomen across the strong pelvic bones.

As a booklet by the National Highway Traffic Safety Administration puts it, "The energy of the man must be dissipated by the body during the collision. Through use of a seat belt and harness, this energy is dissipated by the displacement of fluid and organs within the body with ruptures and hemorrhages often resulting. If a seat belt is not used, however, the energy is dissipated by the crushing of the body and the car as the passenger strikes relatively hard objects in the passenger compartment."

That makes it sound like there will be injuries even to the person wearing belts. Maybe. But the injuries will be much less severe.

Bruises: Here's an example. A friend of ours was involved in an auto accident that included a complete rollover. Even though the car was a mini-compact, the passenger compartment was intact. So was our friend, because she wore her belt. Her only injuries were very distinct bruises across her chest and abdomen, caused by the lap belt and shoulder harness.

A note here: To all those who say seatbelts cause injuries, we say "only minor ones such as our friend suffered." Imagine her injuries had she been thrown about inside the car, or even thrown *out* of the car. She would probably not have survived.

What we're saying is that you can't avoid the second collision once the first collision has happened. But the choice is between colliding with a steering wheel or "colliding" with a belt.

The belt not only spreads out the *area* over which you absorb the collision, it also lengthens the *time* during which you absorb it. This is what is called "riding down" the collision. If a car hits an immovable barrier at 30 mph, it will stop in about one-tenth of a second. The occupant of the car will continue to move at 30 mph within the car. One-fiftieth of a second after the car has stopped, the occupant will have the "second collision" with the steering wheel and other parts of the car. The occupant will have to absorb *all* the force of that collision in a *hundredth* of a second. And he'll absorb it by hitting objects that are hard.

On the other hand, if he's wearing a belt, the force of the first collision will cause his seatbelts to lock up and he will absorb the shock against the harness in the tenth of a second it takes the car to stop.

Here's another example. A family driving in their car came to an inter-

continued

THE EDITOR SPEAKS DOUBLE CLUTCH

IS THERE AN AIR BAG IN YOUR FUTURE?

In September 1977, this column reported that the Secretary of Transportation had announced an important proposal: The government would require the phased introduction over a six-year period of passive (automatic) restraints to protect front-seat occupants of passenger cars in 30 mph crashes.

The Secretary proposed that the new requirement begin in September 1981 for larger cars and that all new cars have such protection after September 1983. Each manufacturer would be allowed to meet the performance requirement by using any design approach it chose. Most people thought that the passive belt, which is automatically in place when the door is closed, would be used in very small cars and that larger autos would have bags.

Numerous public opinion polls, taken by manufacturers, private groups, and government agencies, seemed to show that Americans were overwhelmingly in favor of air bags over the automatic belts, even if the bags cost four times as much as the belts. But in 1978, two pioneers in air bag development—Eaton Corporation and Allied Chemical—dropped out of the business because they did not see enough future sales to justify their investment.

Apparently those companies saw the future more clearly than the rest of us. Early this summer General Motors announced it had cancelled plans to provide air bags as options on its larger 1982 models. Too expensive. No air-bag equipped cars at all from GM in 1982. Other manufacturers are expected to follow GM's example. In fact, if you insist on bags in your new 1982 car, it looks like you'll have to shop at Mercedes-Benz. That company announced last spring that it will equip all 1982 models sold in the U.S. with bags—even the cars not covered by the DOT standard. Which makes Mercedes-Benz the first—and possibly the only—manufacturer offering air bags to buyers in 1982 at all.

Is there an air bag in your future? Not that we can see. GM does say bags will probably be a low-volume option 1983-86. But most cars will have automatic belts. Again, the other manufacturers will probably follow the big company's lead.

AUG

VOLUME 14 NUMBER 3

CONTENTS

Features

The Second Collision 1

Passing Fancy 6

One Dark Night 10

Pro Goes Back To School 12

Commentary 14

Happiness Is 16

Smooooth Control 20

Misconceptions About Tires 27

Wordless Dashboard Signs Back Cover

Departments

Double Clutch 2

Double Tech 17

Timely Topics 18

How It Happens 19

The Backyard Mechanic 22

Backfire 28

COL. WARREN L. BUSCH
Chief, Safety Education Division

VIRGINIA HENDRIX
Editor

TSgt RON LATHROP
Technical Editor

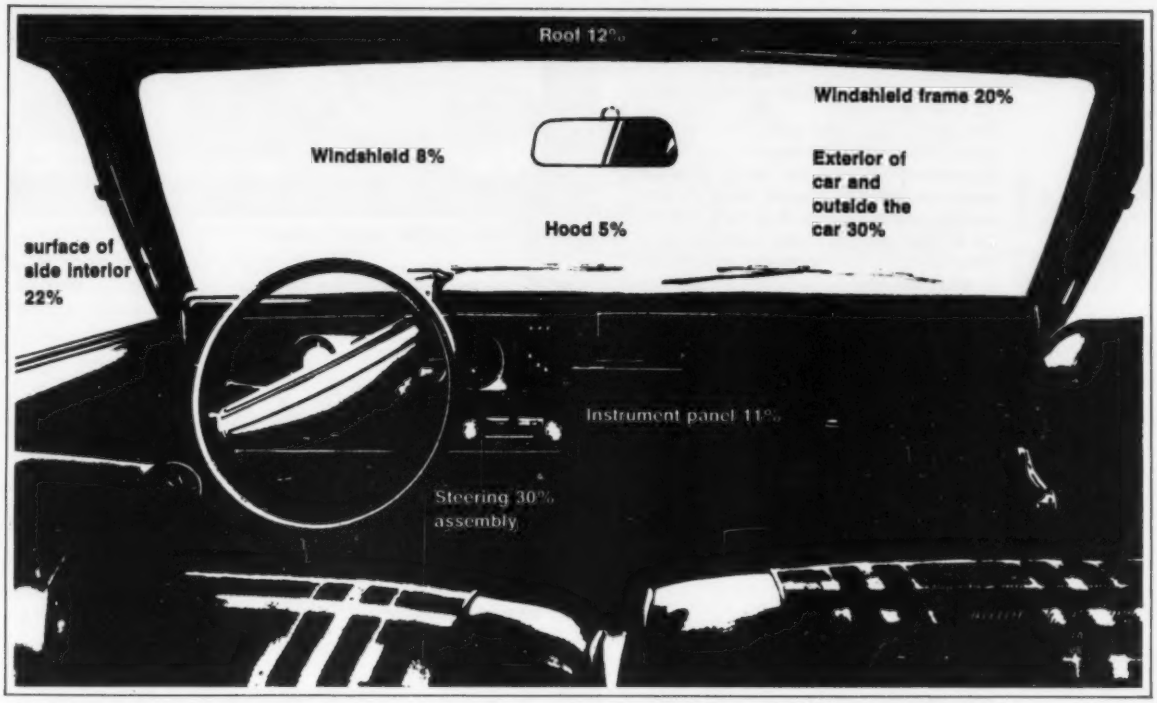
JERI ROOD
Feature Editor

ALICE MILKEY
Editorial Assistant

DON KELLEHER
Art Director

LORRAINE HAMBLEN
Staff Artist

CLIFF MUNKACSY
Staff Photographer



This illustration shows the results of a General Motors study on car occupants who were fatally injured by objects inside the car. The percentages total more than 100 percent because frequently an occupant was injured by hitting more than one object.

section, where they stopped, then proceeded through. Another car failed to stop for the sign and hit the family's car. The parents, in the front seat, were wearing their belts and suffered no injuries. Their son, unrestrained in the back seat, was thrown across the car into the door and the window crank injured his spine.

They all endured the same collision, and the same forces were acting on the occupants of the car. Yet, the parents "rode down" the collision; they had the force spread over a longer time, and spread over the length of their belts. The son had to absorb the impact all at once, and concentrated at one point of his body.

And we'll add that this was an accident at a fairly slow speed.

Impact points: General Motors did a study of accident fatalities several years ago to show what interior car parts had injured the victims. Thirty percent, or nearly a third, were fatally injured by hitting the steering assembly. The windshield accounted for 8 percent of the injuries, and the windshield frame added another 20 percent (see illustration above).

Studies have shown that nearly half of the fatal injuries in auto accidents are head injuries. These, added to the internal injuries of the chest and abdomen, account for about 85 percent of the fatal injuries. And these are precisely the parts of the body that seatbelts are designed to protect, by keeping them from hitting the interior car parts listed above.

Today's seatbelt is a good design. The lap portion of the belt fits snugly over the pelvic (hip) bones to hold the body within the car and in the seat. If worn alone, however, the lap belt allows the body to bend forward at the waist in a front-end collision and hit the sterring wheel and dashboard. This problem is eliminated by the shoulder belt. It runs diagonally across the chest and holds the body away from those hazards. It also allows the force of any accident to be spread across the chest, one of the stronger parts of the body.

The way in which the seatbelt does its job of stopping the second collision is simple. The reel for the belt has a ratchet that locks up in an emergency. One type is sensitive to movements of the car, and the other is sensitive to movements of the belt itself. The former is the type used on most newer cars.

If you want to test whether your seatbelt locking system works, there is a way. If your car has a belt-sensitive system, sit in the seat and buckle

continued

continued

"but daddy never wears it"

Do you buckle your child into his car seat/child carrier whenever you drive anywhere? Good for you. You've made an effort to ensure your child's safety and to ensure that he'll live to go to school, join cub scouts, play little league, or whatever you have in mind for him.

But what about you? When you get in the car with him, do you buckle yourself in before you go? If you don't, your effort to maintain your child's safety may be vain, in the end.

Children are very bright. They pick up an amazing amount of information just by observing. They see you put them in a safe harness-like device. And they see that you don't put a similar device around yourself. Your actions speak very loudly. If they reasoned it out, they might say, "This belt thing is just for little people like me. It isn't for big people."

They're bright, but they can be misled. They know one day they'll be "big people" like you. They want to be like you and they want to do the things you do. And they will. When they get to be "big people," they won't wear their belts either.

Assuming you never had an accident while they're in the car they won't see the necessity of a belt. Again, they might reason, "Daddy tells me I need one to be safe in the car. But I *am* safe. Nothing happens when you're in a car. Besides, Daddy never wears it."

0.000 seconds - car hits barrier

On impact, the car begins to crush and to slow down. The person inside the car has nothing to slow him down so he continues to move forward inside the car at 30 mph.

0.050 seconds - car crushes

The car slows down as the crushing of the front end absorbs some of the force of the collision. The person inside is still moving forward at 30 mph.

0.100 seconds - car stops
0.120 seconds - person hits car interior

One-fiftieth of a second after the car has stopped, the person slams into the dashboard and windshield. This is the human collision. In the car's collision it takes 1/10 of a second to stop; in the human collision it takes only 1/100 of a second.

On impact, the car begins to crush and to slow down.

the belt. Take hold of the shoulder belt and pull outward sharply. The belt will lock up within a couple of inches of your body, just as it would in an accident.

If your car has car-sensitive belts, you need to test them with the car in motion. Find an empty section of road and drive along slowly. It is not necessary to be driving fast; five to 10 miles per hour is fast enough. Apply the brakes hard. The belt will lock up. By the way, try this only on a dry, level, paved road with no traffic nearby.

Myths: Before we leave this discussion of the second collision, we want to attack a couple of widely-held myths. The first is the idea that you can brace yourself against the second collision. Many people think they can brace themselves with their hands or arms. Maybe they can, at speeds less than five miles per hour. But at the moderate speed of 30 mph, an auto collision would throw your body around with a force equal to 30 times your weight. So, if you weigh 150 pounds, you'd have to be able to hold 4,500 pounds. We don't know anybody who can hold up 4,500 pounds besides Superman and the Incredible Hulk.

The figure of 30 times relates to the second bit of popular nonsense, the idea that a parent can hold his child on his lap and protect it from the second collision. The figure of 30 times makes holding a 10-pound infant the same as trying to hold 300 pounds. Get the idea? Unless you're one of the two gentlemen we just mentioned, we suggest you buckle up, and buckle your children in, too.

We want to thank Transport Canada in Ottawa, Ontario, for the information and the illustrations in this article.

HOW CAR-SENSITIVE EMERGENCY LOCKING RETRACTORS OPERATE

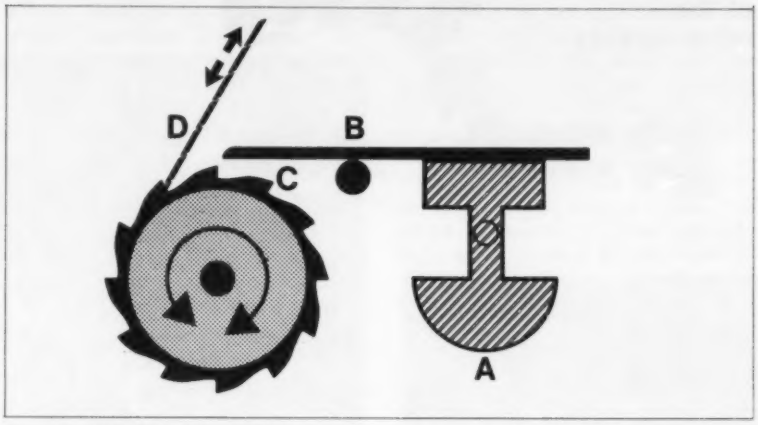


Figure 1—NORMAL CONDITIONS
Under normal driving conditions the pendulum and bar in their normal rest positions. The reel which holds the belt is free to rotate. As the occupant moves forward, say to reach out to operate controls on the dashboard, the belt will move with the occupant.

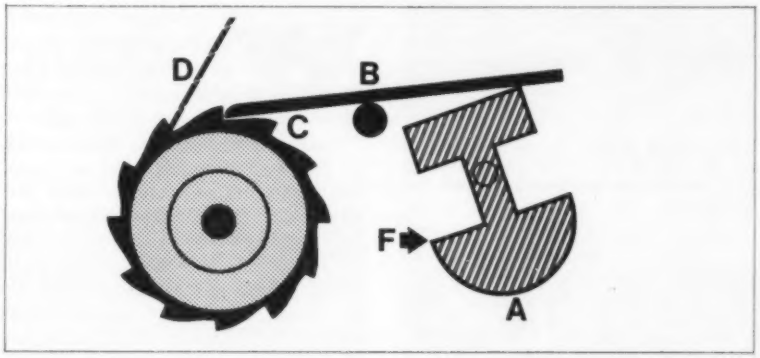


Figure 2—EMERGENCY CONDITIONS
Under emergency conditions, such as in a collision, the pendulum will move forward under the force of the impact (f) causing the bar to engage the ratchet. The reel and seat belt are now locked in place and the occupant is held firmly in his seat.

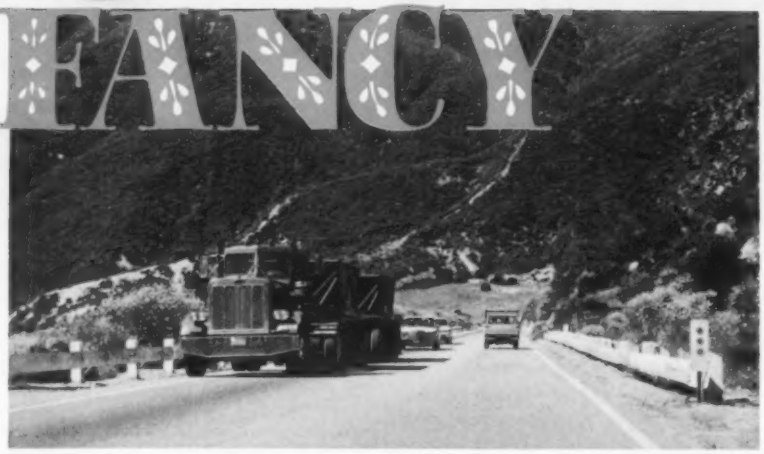
The majority of car-sensitive retractors use a pendulum (a) to sense an emergency condition and a bar (b) and ratchet (c) mechanism to lock the seat belt (d) in place.

As the car slows down, the person moves forward until the seat belts restrain him. The belts keep him in his seat and keep his head and chest from striking the car interior.

Being fastened to the framework of the car, belted occupants are able to "ride down" the collision as part of the car. They are able to take advantage of the car's slower stop, as it crushes and absorbs energy. For belted people there is no human collision.

In defense of the unnecessary

passing FANCY



When two or more vehicles are stuck behind a slow-moving vehicle, the first one in line should pass first.

You should never pass when approaching the crest of a hill. Wait until you are on the downhill side, and then only when visibility is clear.

We're taking this space to talk out of both sides of our mouth about that fine old American tradition of passing on the road.

Passing is unnecessary. Most drivers on the road are traveling at or above the speed limit—in some cases *far* above the limit. We have cited this fact in past articles on these pages, and we have also cited the fact that high speeds waste gas. Since the drivers are already doing at least the speed limit, what excuse is there for going even faster and passing them? Given the speeds necessary to pass someone, you accelerate to velocities sure to attract the attention of the folks in black-and-white cars.

But, having established the senselessness of passing others, we will now tell you how to do just that, because there are special cases. Note we said "most drivers" go the speed limit or better. There are those who motor along at five to 15 miles per hour below the speed limit.

No, we're not saying that's bad. They have the right to go slower than the sign says on the highway as long as they're not impeding traffic. And you have the right not to be forced to conform to their speed. And that means you have the right to pass them.

At times it may even be necessary. If you must be at a certain place at a certain time, it is necessary to pass the

We come upon a slow car that we decide to pass.

We check over our shoulder, signal and move into the opposite lane.

slower-moving vehicle. See what we mean about "talking out of both sides of our mouth?"

Incomplete passes: Perhaps the best way to go about a discussion of passing is to list the conditions under which you may *not* pass another vehicle.

Some of you probably remember the old "Burma Shave" advertising signs that were posted by the highways some years ago. The only one I remember went: "Don't try passing/On a slope/Unless you have/A periscope."

Meaning: Don't pass on a hill. That's simple enough. You can't see what is over the top of the next rise. Maybe nothing, or maybe an 18-wheeled semi.

Also, don't pass on a curve. If the highway is in the mountains, you have the same problem as with hills—you don't know what's ahead. But even with a completely level road, passing on a curve isn't safe. The reason is the additional speed you have to apply to pass the car ahead. This speed, plus the curve, could put you out of control.

It is also illegal to pass another car at an intersection. This is because you cannot tell what the car ahead of you will do. He might go straight, or turn without signaling. The cars on the intersecting road might also do something unexpected. And your actions might cause another car to swerve to avoid you and collide with something else.

A special kind of intersection is the railroad crossing. You cannot pass another car here, either. Not only could your passing cause the other car to go off the road, but he might see something you don't. Like a train, for instance.

Also, in most places, it's illegal to pass another vehicle on a bridge or in a tunnel. We should mention that these rules apply when there is only one lane for traffic moving in your direction. If there are two or more lanes, passing on a hill or a curve is okay, if you do it with caution. You may *not*, however, change lanes in the middle of an intersection to pass another car. We'll get back to multi-lane roads later.

Lines and passes: The lines on the road are usually a good indicator of whether or not it's legal (and safe) to pass. A solid yellow line in your lane means "Do not pass." A broken, or dotted, line in you lane means "You may pass with caution."

On long, straight, level roads the line will be a dotted one, signifying that it's safe for traffic on either side to pass, if there are no oncoming cars. The solid lines are normally used where something limits the visibility, as on roads with hills or curves, like in the mountains. If you're approaching a hill or a curve, the solid line will appear in your lane some distance before you reach it, telling you there isn't enough visibility for a safe pass. At the crest of the hill, the line will begin in the other lane, and disappear from yours. At that point you can see, but the oncoming driver, who has yet to reach the crest, can't. Sometimes there's a solid line in both lanes, when it isn't safe for anyone to pass. (See the illustrations for a better idea of this.)

Always watch these lines, and obey them. They have been painted on by the highway department as an aid for you, based on the space necessary for you to pass safely. (The lines are also based on the visual range of a person at a certain height, as seated in his car. Drivers of low sportscars should keep this in mind as they watch the lines—they can't see quite as far as the driver of the large sedan. However, we wouldn't want the drivers of higher vehicles—high-riser pickups, for example—to get overconfident. They should also obey the lines.)

Pass completion: Okay, we've probably given you enough preliminary cautions. Now we'll explain the "how-to" of passing.

Basically, you go into the opposing lane, accelerate, pass the guy ahead

continued

As we pass the first car, we make a decision about the safety of passing another slow-mover at the same time.

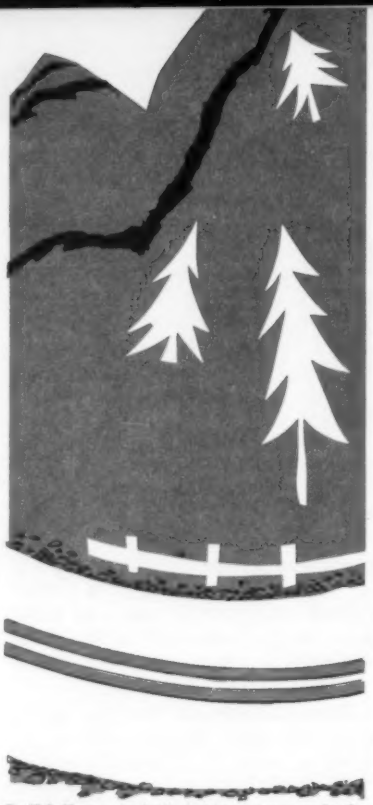
We continue the passing maneuver . . .

. . . **And get back** into the right lane. Note that an oncoming car is in our lane, passing another car.

passing fancy

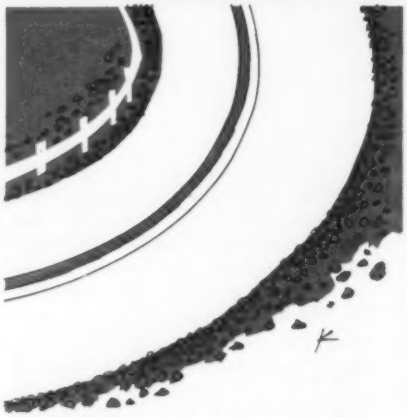
continued

A solid line in your lane means it is not safe for you to pass.



Solid lines in both lanes means nobody can pass from either direction.

Especially slow-moving traffic, such as road equipment, may be passed. Wait for the equipment driver to signal it's okay.



When the solid line is in the other lane, you may pass, but oncoming traffic may not.

Although the truck is moving more slowly than we would like, we can't pass on a curve.

and get back into your own lane. And if you think it's that simple, go back and read the previous paragraphs. Passing can be risky. You have to watch for oncoming traffic, for entering traffic, for the movements of the car (or cars) you're passing, and for the movements of cars following you.

The first thing to do is to get to the safe following distance (two seconds behind the car ahead) and match his speed. Then check the road ahead. Is there enough room for a pass, that is, can you see far enough, and are the opposing lanes clear? You will need 10 to 12 seconds to pass him.

If you can see far enough and there are no opposing cars, check your mirrors for cars following you. There might be someone behind you with the same idea; make sure nobody is attempting to pass you. Look over your shoulder to eliminate blind spots. Then, signal your intentions to anyone who's interested (flashing the lights and hitting the horn might also be a good idea). Turn on the left signal and move out into the opposing lane. Accelerate your car and pass the one ahead. Watch him as you pass; he might speed up or make some other movement if he hasn't seen you.

Now, don't pull back into your own lane until you see the car in your inside rearview mirror. Give him room. Signal to the right and drive back into your original lane. Slow down if you're above the posted limit and continue on.

Pass interference: That was an easy pass. What could happen to interfere with it, to make it more difficult?

The car you're passing could do something. If he hasn't seen you, or if he doesn't want you to pass, he could try to speed up. In this case, don't try to accelerate still further. Drop back and get back into the right lane. You can either try again later or keep back, depending on his reason for speeding up.

Oncoming traffic can also run pass interference. As we said, you need 10 to 12 seconds to complete the pass. If there are oncoming cars, you need more space. "How much?" is a good question. The American Automobile Association and some driving schools

Traffic is stacking up behind this large truck. He is required by law to get out of the way and let them pass.

And at the first available turnout, he does.

say that if you can detect movement in the oncoming car, it's too close; wait until he passes by.

The other category of car is also important – the one following you. That's why we said to check for his movements. If he's started to pass you, let him go by before you move. Even if he isn't even with your car yet, stay in place. If you try to pass ahead of him, you might rattle his nerves and cause him to have an accident. It's also good to note here that just because he's passing, don't assume it's safe for *you* to pass. He may be a daredevil who likes close calls. Make your own decision, and make it on the basis of caution.

The road can also interfere. If you start to pass and then see a blind curve or hill coming up, drop back and get back into the right lane. Another car could appear at any second. And again, watch the lines. If the solid line appears in your lane, drop back. It's there for a reason, perhaps something you can't see.

Also, drop back if there's anything lying in the opposing lane in your path – an animal, a tree limb or some trash, for instance.

Pass attempts: If a line of cars strings out behind a slow moving vehicle this creates special problems. First off, we'll mention that the slow-mover should get out of the way. If you're the slow one (say you're hauling a boat) and there is a turn-off designed for the purpose, as there often is on mountain roads, you should turn out and allow the others to pass before you get back on the road. It will save you from having 15 angry motorists honking along behind you.

If the conditions and the visibility make passing possible, the ones first in line should pass the slow car first. This isn't for courtesy, it's for safety. The first car behind the slow car has only *one* car to pass, and he can do it quickly and easily. Those farther back have two, three or more cars to pass, which increases the time necessary for the pass, and increases the chance that something will interfere.

However, there are times when this is also necessary. If you're third in line behind a slow-moving motorhome and the two drivers ahead are too timid to pass, you'll want to get out of there. But be very careful as you pass – one of those ahead may get the courage to pass just a second after you do, and may collide with you. Watch them very carefully.

Let's take this a step further. As you pass the two cars ahead, you see an oncoming truck that is too close to allow you to complete the pass of the motorhome. Drop back to your original position and get back in line. Trailing traffic will probably slow down to give you a gap to slip into, or leading traffic may speed up, if they can. Or they might squeeze to the right to allow you some space to get through. (Note the "probably" and the "might." There's no guarantee in these cases, so you must always give yourself a way out. Avoid a head-on collision with another vehicle at *all* costs, even to the extent of driving off into the ditch. See? We said passing was risky!)

If you are one of the cars in the line and someone else is facing the truck, open a gap for him to get back in line. Think how you'd feel in his place. Ditto, if you're the one in the truck – squeeze to the right and give him as much room as possible.

Lateral pass: In contrast to all this, passing on a four-lane road is a snap. You don't have to face opposing traffic, which eliminates the problem of needing a 10 to 12 second gap. You just signal, move into the next lane and go ahead. The four-laners even make allowances for slower vehicles – they are supposed to use the right lane and leave the left lane for faster cars, or cars that want to pass them.

The chief problem in multi-lane roads may be the ease of passing, or more specifically, the safety the driver feels in passing. Many cars have been sideswiped, and many more have been *almost* sideswiped, by drivers who didn't look around them enough to make sure a lane change was safe.

Always look around you to make sure nobody is overtaking you in the lane you want to enter. Always signal for that lane change (and always remember to cancel the signal after the change is complete).

Do your passing on the left, whenever you can. If you move to the left around a slow car and find another slow car in the left lane, flash your lights at him or sound your horn to get him to move over to the right and allow you to pass. Although passing on the right on a multi-lane road isn't illegal, it could be seen as weaving in and out of traffic by the police.

Driving on multi-lane highways was covered in more detail in "Life in the Fast Lane," August 1978 DRIVER.

And since we can't resist just one more pun: "We hope that all your passes will be complete and that none will be intercepted!"

one DARK night

by SSgt ALAN J. DOSTAL
RAF Mildenhall
Photos by author

It happened one clear, dark night. As the lights of an approaching car topped a rise, the sergeant reached down automatically to switch his lights from high to low beam. As he gave the lever a swift flick, his car was plunged into complete darkness. He had pushed the lever too far and shut the lights off.

He fumbled for the lever again, but in his haste got hold of the wrong one. The left turn signal came on instead. The car veered from the road.

The driver of the on-coming car saw the sergeant's car leave the road, bounce over a grassy area, and crash into a line of trees. When he stopped to give assistance, he found the sergeant already dead.

This re-creation of an actual accident is based on eye-witness and investigation reports. How was it possible for an experienced driver to accidentally turn off his lights?

With the switch system in his car, it was an easy mistake to make. In most European cars, the high beam switch is mounted on the steering column and does only two things: it either turns the headlights to high beam or back to normal driving. But on some models, such as the car the sergeant was driving, the switch happens to have three positions: high beam, low beam, and OFF. A single flick of the wrist can move it from one to another, even from high beam to OFF. This light switch movement is further complicated by the fact that the turn indicator is placed directly below and less than one inch from the light switch.

The position of the switches after the crash told the story. The accident investigation team found the headlight switch in the full up (OFF) position and the turn indicator in full down (left turn) position. As their report said, "It appeared the driver inadvertently moved the light switch too far; the switch went past the low beam position and into the OFF position . . . in his haste to correct the situation, he may have hit the turn indicator instead of the light switch . . . a second later he hit the tree." There was no time for another try.

The turn indicator is not the only switch co-located with the light switch in European cars. Many cars have the wiper switch placed close to the light switch. It may be on the column or on the dash. Most of the switches, when new, have a lamp or wiper painted on the switch. In the daylight it is easy to distinguish between the two. But after dark another problem arises. Only the gauges are lighted, not the switches. Now it is a matter of remembering which is which.

"The light on-off switch and the wiper on-off switch are located about two inches apart on my dash," explains one sergeant whose car is eight years old. "The markings were worn off of them when I bought the car. The first time I was driving at night and it started to rain, I reached down to turn on the wiper. Everything went dark. I realized what I had done and quickly got the lights and wipers on. But in the instant everything went black, my heart started pounding like a jackhammer. I wasn't about to let that happen again."

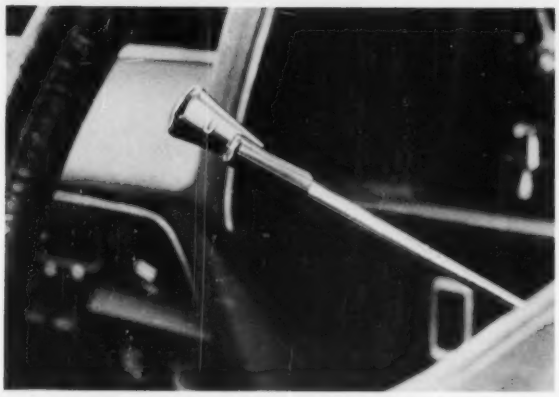
The sergeant painted his light switch with textured paint (paint with sand in it). "Now, day or night, I can tell which switch is which without even having to glance down," he says.

A similar incident happened to a captain. "My main light on-off switch is located on the dash. My dimmer switch is a lever on the column. It's a three-position switch that will also shut the main beams off but leave the parking lights on," he explains. "My wiper switch is also a lever located on the column just a little closer to the dash.

"One night my wife and I were returning home from a movie and it started to rain. We were discussing the show and I reached down to flip on the wipers. I hit the wrong lever. At night in the rain is not the time to drive with just parking lights."

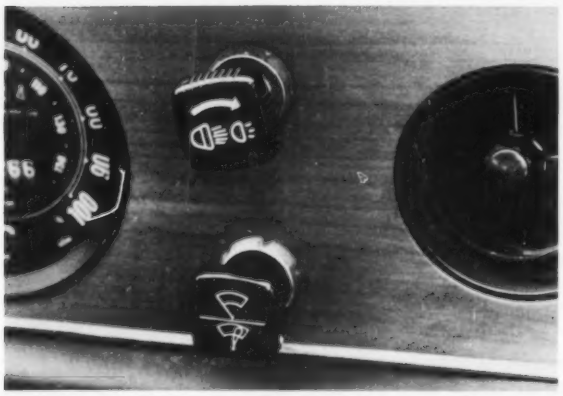
The captain made sure it wouldn't happen again by taping a piece of sand paper to the light switch with double-sided carpet tape.

Driving in Europe poses many new challenges to Americans. Adjusting to driving on the "wrong" side of the road is the most obvious problem for Americans in England. Add to that a European car made to British or Continental specifications and the combination can be dangerous. Throw in co-located switches, and you raise the stakes from dangerous to deadly.

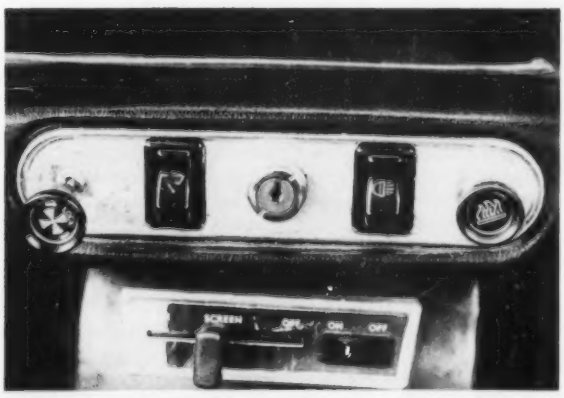


One of these levers is used for the headlights and the other lever is for turn signals. The one at the back is a three-position switch—high beam, low beam and parking lights. It also has the horn on it.

The older a car gets the harder it is to make out what was once painted on the levers and switches. The switch in the background turns the lights on and off. The lever on the right controls the high-low beam, horn and parking lights. The one on the left controls the turn indicators and windshield wipers.



The top switch is for the lights and the bottom for the wipers. To turn on the lights or wipers the switches are pulled out. To change from high to low beam, the light switch is rotated. To change the variable speed wipers, the wiper switch is also rotated. In the daylight the markings are clear, but at night it is anybody's guess.



The identical switches on either side of the ignition turn on or off the lights and wipers. In some cars these switches are located even closer together and in older models the markings are worn off.

Co-locating two switches confuses the issue in European cars, but this late model car has gone one step beyond that. The four switches, none of which are lighted, are all the same size and shape. One turns the lights on and off, one the rear window defroster, one the emergency flashers and the final one the parking lights. At night in an unfamiliar car it is like playing Russian Roulette.

NEIL BONNETT

PRO goes back to school

The start of the Warner W. Hodgdon 400 finds 35 Grand National stock cars chasing Cale Yarborough through the Riverside esses.

Professional race drivers don't learn their trade in school. Oh, there are places that will exchange the taste of racing for a few bucks, but most of the learning comes with experience.

Yet, the way Neil Bonnett had been getting experience at Riverside International Raceway just wasn't working for him. "Sure, I'm a veteran of round track and ovals," Bonnett noted, "but I've never had much success here." "Here" is the 2.62-mile road course in Southern California.

"Every time I'd been at Riverside I had driven hit or miss and trial and error," Bonnett continued. "I never knew what I was doing and I dreaded coming back here."

To correct the problem he spent Tuesday and Wednesday before the recent Warner W. Hodgdon 400 race at Bob Bondurant's School of High Performance Driving at Golden State Raceway in Northern California. Bondurant is a former Formula One driver whose school provides classes in high performance driving, competition road racing, advanced road racing, corporate chauffeuring (anti-terrorist, anti-kidnaping) and pursuit driving.

At the Sonoma race track Bondurant tutored Bonnett. "We just worked on basic fundamentals—proper braking, how to enter a turn," Bonnett commented. "I'm driving on a whole new part of the track here now."

Did the schooling work? Bonnett thought so. "I never knew how I was going to run through turn six (in past races at RIR). When I'd get up there, everyone behind me would back off three feet," Bonnett chuckled. "When the race was over, I'd just say I was glad I didn't have to go back. . . . This is the only time I've raced here and have looked forward to coming back. Road racing can be fun.

"I talked to myself all the time," Bonnett observed, "making myself do the things I'd learned from Bondurant. I felt like I had control of the car, something I'd never felt here before."

And he did have control of the car. "My fastest lap before this race was 108 mph," Bonnett declared. "Today that was probably my slowest. When I arrived Friday and took my first practice lap I was a second and a half quicker than I'd ever been before." Even though he was running three to four seconds a lap faster than he had ever run at Riverside, Bonnett still felt the car could go faster.

If three or four seconds doesn't sound like much, consider the difference in lap speeds: 108 mph versus 112 mph. Think of how many racing teams spend thousands of dollars just to gain a fraction of a mile per hour. Bonnett spent about $500 for four mph. This new-found speed gained Bonnett nearly an eighth of a mile per lap on the track. The National Association for Stock Car Auto Racing event covered 95 laps.

Bonnett qualified seventh behind Cale Yarborough, Darrell Waltrip, Bobby Allison, Bill Schmitt, Dale Earnhardt and Richard Petty. However, in Grand National racing not all the competition is at the front of the grid. Behind Bonnett were the likes of Benny Parsons, Dave Marcis and Donnie Allison.

Content to let traffic sort itself out, Bonnett held his position in the opening lap. On the second lap a car spun out of the race at turn eight, bringing out the first caution flag of the day. When the green waved again on lap four, Waltrip took the lead away from Yarborough. On the next lap Yarborough lost second to Bobby Allison in turn nine.

Earnhardt was the early man on the move as he took third on lap seven, second on lap eight and passed Waltrip on the outside of turn nine for the lead on lap nine.

At the end of 10 laps Earnhardt, Waltrip, Bobby Allison, Yarborough, Petty and Parsons were in front of Bonnett.

The yellow flag reappeared on lap 12 when a competitor blew an engine on the front straight. On the first lap the yellow was out, Bonnett, Bobby

---

The National Association for Stock Car Auto Racing and Union Oil have made even more moves to save gasoline used in racing since DRIVER Magazine reported "The Decade's First Race" in the March 1980 issue. At current races one of the most

"What I needed was road-racing technique," noted Neil Bonnett, pilot of the Woods Brothers' number 21. And Bondurant's school gave him just that.

(right)
The finish of the 400-kilometer event found Darrell Waltrip edging Neil Bonnett by a car length.

Allison, Parsons, Petty and Earnhardt all pitted for fuel as well as left and right side tires. The next time around Yarborough did the same. On the third lap under the yellow Waltrip and Donnie Allison took on fuel and tires all around.

The green waved again on lap 17, but on lap 19 transmission troubles dragged another car to a stop at turn eight where it suddenly caught fire. The yellow flag was out again.

Running under the yellow on lap 20 Earnhardt, Bobby Allison, Yarborough, Petty, Waltrip, Parsons, Roy Smith and Schmitt were in fromt of Bonnett.

As the green again flew on lap 22, Bobby Allison pushed past Earnhardt for the number one position. Then on the 26th lap Donnie Allison's engine failed at turn eight and the field was again brought under the yellow. Jumping into the pits were Parsons, Bobby Allison, Petty, Yarborough, Waltrip and Earnhardt as well as Bonnett. Petty pitted again on lap 29 and lost a lap as the crew worked under the car. When "King Richard" Petty returned to the heat of competition he had fourth gear only.

When the race jumped to full speed under the green on lap 30, Bonnett wasn't even in the top 10. Lumbering around in fourth gear, Petty went two laps down on the leader when Earnhardt passed him on lap 35. Yet there were still 22 other drivers on the same lap as last year's rookie of the year, Earnhardt. Approaching the half-way point, the lap 40 leaders' board had Earnhardt, Allison (Bobby, remember Donnie blew his engine and was out of the race), Parsons, Waltrip and Smith in front of Bonnett. At this point Petty's transmisison started working again.

On lap 49 Allison passed Earnhardt for the lead between turns one and two. With 50 laps run, Allison, Earnhardt, Parsons and Waltrip were in front of Bonnett. On the next lap, Parsons took second place from Earnhardt. During the next few laps the leaders began pitting. Parsons on lap 54, Waltrip on 55, Allison and Earnhardt on lap 57.

Bonnett led the race for the first time as he completed lap 58. But he finished that lap pulling into his pit, so his spell at the front of the pack was short.

On the 59th lap a car stalled at turn two, bringing out yet another yellow flag. As the cars completed the 60th lap under the yellow the order was Allison, Parsons, Bonnett, Earnhardt, Marcis, Waltrip and Yarborough, the last two having just jumped into the pits. On the next lap Allison, Parsons and Bonnett revisited the pits for tires.

When the green flag unfurled on lap 62, Bonnett stormed to the front of the pack. At the 70-lap point, Bonnett led Waltrip, Allison, Earnhardt, Parsons, Yarborough and Marcis, all on the same lap.

With 25 laps left, the race really began to develop. And, as always this late in the competition, the question of who among the front runners could go the distance without an additional pit stop started spreading up and down pit row. To psych the competition, Earnhardt's crew announced Dale was going to go the distance.

On lap 73, Waltrip passed Bonnett for the lead at turn two. The 80-lap rundown had Waltrip, Bonnett, Allison, Parsons, Earnhardt and Yarborough all on the same lap. On lap 83 Parsons gave in to the pressure and pitted for left side tires and fuel. But the real drama unfolded when Waltrip took 5.86 seconds out of the race to take on fuel only on lap 84, handing the lead back to Bonnett.

Then on lap 87, Allison passed Bonnett for the lead at the exit of turn nine. However, his lead was short lived as he lost a valve going down the backstraight on lap 88 and began smoking. Black-flagged on lap 89 as he pitted, Allison never really stopped moving as he took on fuel and the crew pushed him back into competition. The black flag continued to wave for Allison

continued on page 18

TEN GALLONS SHORT AND A DAY LATE

important things crews look for when first reporting to the garage is the gas sign. It usually reads: "10 gallons for practice and qualifying today." This means that Union 76 will pump only 10 gallons of 103½ octane racing gasoline into each car that day. With that 10 gallons, the team must practice, set the car to handle its best and turn in their laps under the official timer.

For the Warner W. Hodgdon 400, Riverside International Raceway went a step further. They cancelled Thursday practice all together. This not only saved the 10 gallons per vehicle, but a day of traveling bills. You see, most of the NASCAR Grand National teams are headquartered in the Southeastern section of the country.

Commentary

As Director of Aerospace Safety, my job is the preservation of lives and military equipment through the prevention of accidents. Most people think immediately of aircraft accidents, but actually we lose more Air Force lives in private vehicles than in airplanes. Increasingly, those private vehicles are motorcycles. When I say I read every word of every report of every motorcycle accident, it isn't just because I'm a rider myself. I care, professionally and personally, about you riders.

Being a motorcyclist is much different from being an automobile driver. To my mind, it's more like being a fighter pilot or a downhill skier. Motorcycling requires training, highly developed skill, and fine concentration.

Riders often tell me that the real cause of street motorcycle accidents is the automobile driver, who grabs the cyclist's right-of-way, cuts him off, turns in front of him, and insists "I didn't see him." Sure, those things happen sometimes and we have to be alert for them. But almost half our motorcycle accidents are single-vehicle mishaps. No car is involved. The cyclist simply gets himself in trouble.

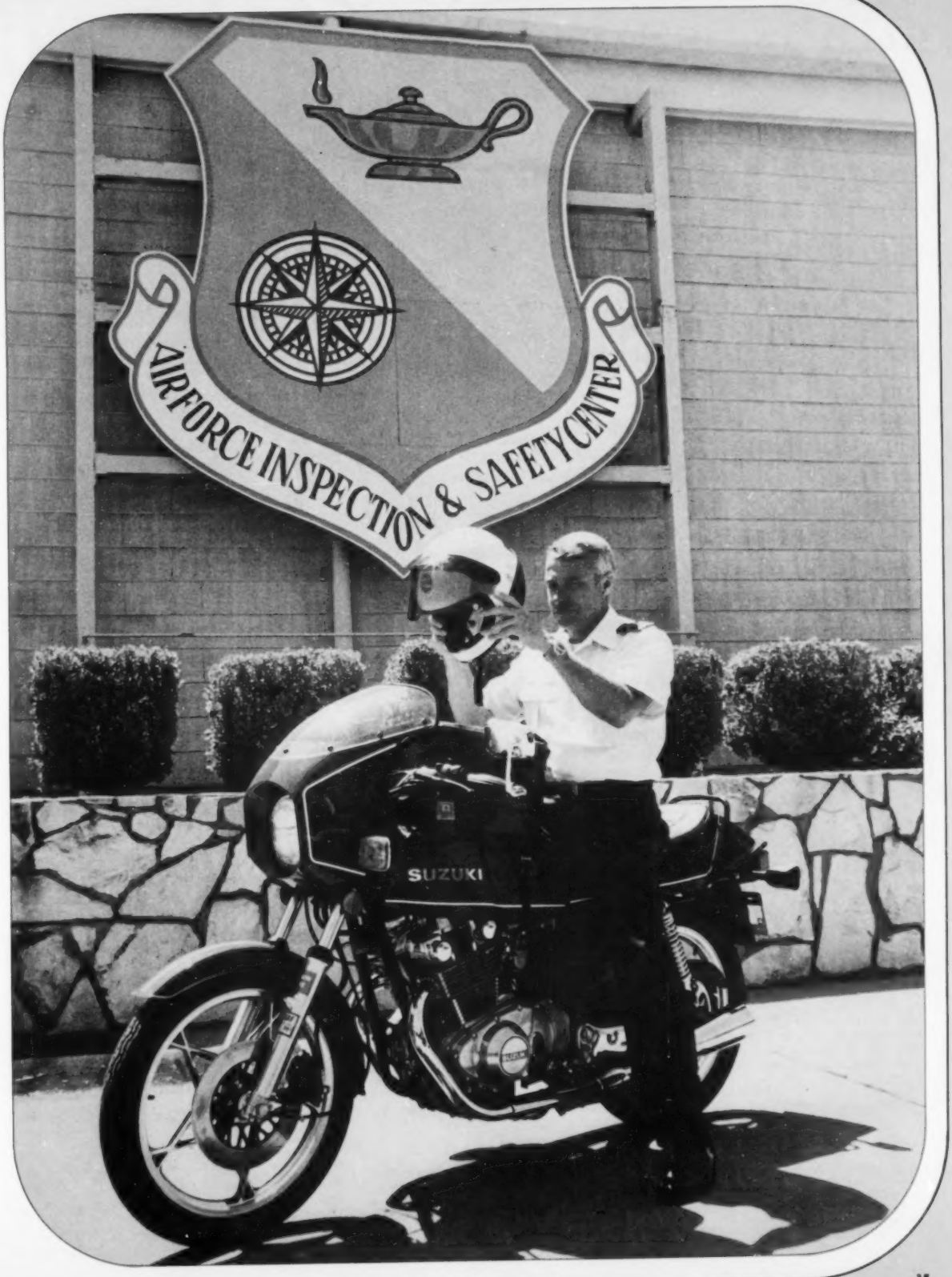
I've been riding for over 30 years (my first bike was a 1937 Harley 45) in many parts of the world, always for fun, sometimes for necessary transportation. From my experience, I'd like to say just two things:

First, learn to be the very best rider you can. Be alert and concentrate on riding 100% of the time. Take advantage of everything the Air Force offers you in terms of improving your skills. Many bases provide hands-on instruction from expertly trained riders. All bases offer the multi-media programmed instruction (Course VII) designed especially for cyclists. I went through that instruction myself a few months ago when I registered my bike on Norton AFB, and it was good for me. No matter how much experience a rider has, there are new things to learn and old things to remember or relearn. It gives you a chance to review your riding habits in terms of the dangers that exist in your current riding environment.

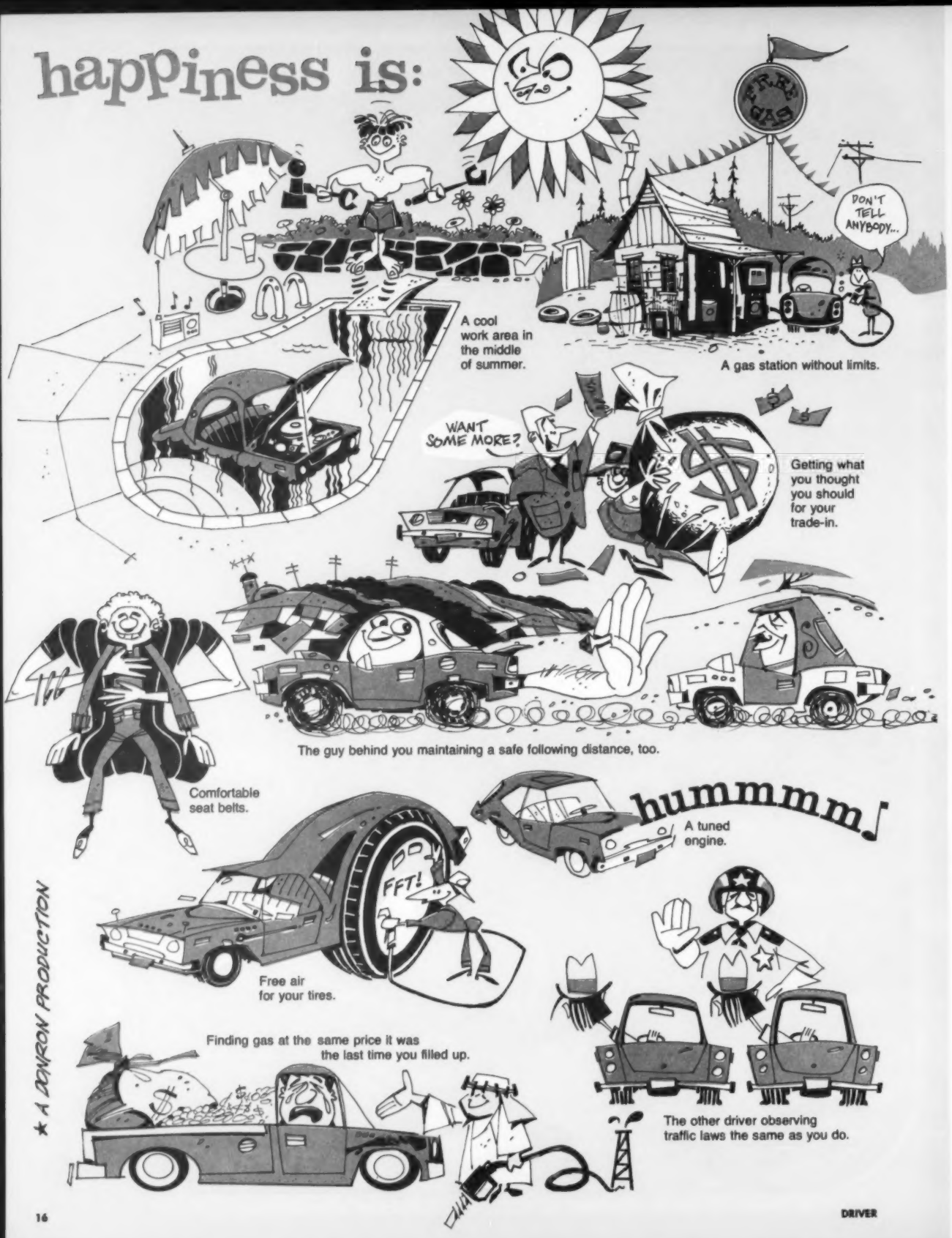
Second, wear your protective equipment, particularly the helmet, but don't let safety gear lull you into thinking you're invulnerable. No helmet or set of leathers ever prevented an accident. Only your own skill, awareness, and concentration can do that.

Motorcycles offer economical transportation as well as a lot of plain fun. The better you are at it, the more pleasure riding will bring to your life. And there'll be fewer of those accident reports for me to review. Thanks for reading DRIVER.

Leland K. Lukens,
Colonel, USAF


AIR FORCE INSPECTION & SAFETY CENTER
SUZUKI

happiness is:



A cool work area in the middle of summer.

A gas station without limits.

Getting what you thought you should for your trade-in.

The guy behind you maintaining a safe following distance, too.

Comfortable seat belts.

hummmm♩

A tuned engine.

Free air for your tires.

Finding gas at the same price it was the last time you filled up.

The other driver observing traffic laws the same as you do.

★ A DONRON PRODUCTION

tteecc!h!h
DOUBLE TECH Q A

With TSgt RON LATHROP

Last January an ugly tear occurred on my vinyl dashboard, probably from the extremely cold winter. The car is over three years old. I was told I should have applied a vinyl conditioner on the surface at least twice a year. That's OK, but in the meantime what is the very best repair for the rip?

Use a vinyl upholstery and top repair kit. You simply trim the ripped area and apply the repair material which is a vinyl putty that comes in colors that match interiors. Smooth the area with a spatula. Then you select the proper graining paper from the kit. Place the graining paper on the putty and heat with an iron. Remove the paper. Next week you won't be able to find the patch.

You're also correct about using a vinyl conditioner to protect the surface.

Psychologically, it is always good to repair and replace damaged interior parts. After all, who wants to drive a car that looks like the inside of a dumpster?

I change my oil. What do I do with junk I drain out of the crankcase?

You're really lucky to live in California in this case as the state's Solid Waste Management Board has issued a list of service stations that accept used oil. This is a cooperative effort aimed at conservation and ecology. More than half of the states have or are in the process of establishing similar programs. In most places you can usually find a firm to handle waste oil by either contacting local service stations or checking the yellow pages under: Oil-waste.

We're having an office argument about one item in "Protecting Your Petrol Piggybank," April 1980 DRIVER. Some people here don't think putting the car's transmission in neutral at a stoplight saves anything. How about some details?

Whenever a vehicle's automatic transmission is in gear, there is a drag on the engine because the bands and hydraulic couplings are engaged. To compensate for this drag, the idle speed screw has a few more turns cranked into it, keeping the throttle plate open a little farther and boosting the engine's speed. You can feel this because on level ground you must keep slight pressure on the brakes to stop the vehicle from moving forward. However, a better demonstration of this is on slight inclines, where you don't have to put your foot on the brake yet the car doesn't slide backwards. In the case of the incline, you are allowing the automatic to work as if you were slipping the clutch in gear to hold the vehicle on the hill. Surely those who oppose DRIVER's "shifting to neutral" statement will agree that holding a car on an incline by slipping the clutch wastes gasoline. Such is the case with the automatic – when it is in gear but not moving it is wasting gasoline.

This drag can be seen with a vacuum gauge. With the gauge hooked up notice the reading in neutral; now with the emergency brake set and somebody holding the brake down with his foot, notice the reading on the vacuum gauge with the vehicle in gear. The reading in gear will be substantially lower than when the car was in neutral. This means the throttle plate is open wider than necessary – as explained earlier – and is wasting gas.

The argument you've probably run into is that the vehicle idles faster when the transmission is in neutral, as would be expected from the wider throttle plate opening. This is true, the vehicle's engine is idling faster. However, "faster than what" must be considered. It is idling faster than a similar engine without an automatic transmission, and faster than it does in gear with a load on it. The end result, however, shows in the vacuum gauge. As pointed out in the January 1980 DRIVER: The best fuel economy is at the highest vacuum reading, which indicates the engine is getting the most out of every drop of fuel. And that happens with the automatic in neutral, not drive. That should neutralize the skeptics.

Editor's Note: Double Tech is a question and answer column in which DRIVER will attempt to make clear some of the cloudy subjects in readers' minds. Unlike other automotive magazine Q&A columns, Double Tech doesn't deal with specific questions such as, "Why is my Wink-Snoozymobile hard to start on a rainy morning?" Instead Double Tech fields questions that are of general interest to the majority of our readers. However, when sending questions to Double Tech be sure to include all available information, because this will help in finding the correct solution. If you have a question you'd like an answer to, and you feel others could use the knowledge also, send it to:

Double Tech
DRIVER Magazine
HQ AFISC/SEDD
Norton AFB, CA 92409

As with most magazines, DRIVER has a long lead time between writing and publication, so don't be surprised if it takes several months to get a reply.

pro goes back to school

continued

until he pulled behind the wall and into the garage on the leaders' 92nd lap.

The 90-lap rundown had Bonnett, Waltrip, Earnhardt, Parsons, Yarborough and Allison on the same lap.

"About four laps from the end I felt my fuel coughing so I started to save it every place I could," observed Bonnett. "I was running fourth gear through the esses instead of third. I saw Darrell back there in my mirrors and I figured he could never catch me. Then suddenly there he was and I had to do what I could to hold him off."

Waltrip made an attempt to pass Bonnett coming out of turn nine on lap 94 as the white flag – meaning one more lap to go – waved. But Bonnett cut him off going into turn one. "I thought that I could get him and I couldn't," Waltrip explained. Following the chase through the esses, around turn six and down the short chute, Waltrip made a second attempt to pass as the cars approached turn eight. "I thought I had him again and I didn't," Waltrip continued. His desperate move to pass Bonnett sent Waltrip off the track across the desert, but he stayed glued to Neil's bumper as they roared down the more-than-a-mile-long backstraight. "That Ford really pulls," Waltrip commented about the speed of Bonnett's car on the straight.

"Just as we got into turn nine my car coughed and slowed just a hair," Bonnett explained. "Only Darrell's great reflexes saved him from hitting me."

Waltrip looked at it differently when he described the turn nine move. "And then I thought I couldn't (pass) and I did."

Both drivers felt they went into turn nine too fast, Bonnett on the normal racing line, Waltrip high on the outside. Both race cars began to slide, so both drivers had to back off the gas a little, but the cars continued to slide. Bonnett had a left rear tire that was going flat, so he slid a little more. The two cars touched. That was just enough to straighten Waltrip's vehicle and allow him to accelerate to a three-tenths second, $22,100 win.

"If you lose a race by 500 feet, 300 feet, 100 feet, it's different," Bonnett said afterwards, "but to lose a race like that – well, there's a lot of personal satisfaction. Darrell drove one heck of a race. I feel almost as pleased as if I'd won."

Timely Topics

LITTLE FOLKS GET DRUNK FASTER

If you're a lightweight, watch out how much you drink because you'll get drunk three times faster than a big person, reports Blue Cross.

Studies show that one hour after one drink, a 100-pound person has three times as much alcohol in the bloodstream as a 200-pound person.

So little guys should take precautions when they drink, says the insurance company. High-protein food such as cheese, eggs and meat will slow down absorption of alcohol into the bloodstream. So will drinking liquor mixed with water or fruit juices. However, carbonated mixers speed the absorption of alcohol into the blood.

HELMET USE IN TEXAS

Researchers at Texas A and M University report increased injuries and fatalities among motorcyclists following removal of the requirement that all Texas motorcyclists wear helmets. Accident and medical records were examined for one year before and one year after the law was changed in August 1977, and questionnaires were submitted to accident victims. The data showed that while motorcycle accidents rose only 5.3 percent following the helmet law change, the number of "dead on arrival" accident victims doubled. The number "treated and released," on the other hand, was lower during the post-law period, suggesting that more of the victims suffered severe injuries.

Only 5.2 percent of the injury and fatality victims were without helmets before the law change while 51.9 percent were helmetless after. The cost of treating motorcycle injuries rose 63 percent at Dallas' Parkland Hospital and 44 percent at Houston Memorial Hospital following the law change. The victim questionnaire showed that three out of five favored required helmet use for all. Only those under 18 are now required to use helmets in Texas.

TOLL-FREE TELEPHONE HOTLINE

We have often mentioned the special toll-free telephone hotline set up by the National Highway Traffic Safety Administration (NHTSA) to report auto safety problems. Recently we got more information on the hotline, which we'll now pass along. When you call to report a car safety defect, the operators will ask for your name and address and they will send you a form to fill out on the problem. When you return the form, they give it to their investigators for action. A copy is also forwarded to the manufacturer of the vehicle, along with a letter asking for their help in resolving the problem. NHTSA reports that many car owners have received assistance from these referrals. The hotline operators can also give you information on recalls in effect, and they will send printed copies of recall information if you request them.

The number? 800-424-9393. In the Washington, D.C. area, dial 426-0123.

POTENTIALLY HAZARDOUS MOTORCYCLES

The American Honda Motor Company, Gardena, Calif., reported its 1980 Honda CR125R Elsinore Motocross Motorcycle has a potential fire hazard. The company said the cycle's expansion chamber could break at the upper welded seam after extended use of the vehicle at high engine speeds. If the seam breaks, Honda said, exhaust gases could discharge near the plastic fuel tank above the expansion chamber, presenting a potential fire hazard.

In all the reported cases, the CPSC (Consumer Product Safety Commission) product defect correction division made a preliminary determination that a substantial hazard exists and that remedial actions should be undertaken.

DON'T TAMPER WITH EMSSION CONTROLS

Car owners who alter the car's emission-control system in the hope of getting better gasoline mileage are warned that it can add to their expenses. It's also illegal.

The Automotive Information Council (AIC) points out that tampering can reduce the efficiency of the engine system by upsetting the balance of the elements. Result: Lessened fuel economy and performance. And at trade-in time a dealer might deduct the cost of restoring the emission devices in order for him to sell the car within Environmental Protection Agency regulations. Tampering also could void warranty coverage of the engine and its components.

Motorists are warned not to substitute leaded fuel in cars which require non-leaded gasoline because it can clog and ruin the expensive catalytic converter. Enlarging the gas filler neck to allow use of leaded gasoline is considered tampering, as is use of a non-certified carburetor.

Emission control is part of the total design and function of the engine, including the carburetor, distributor, fuel pump, manifold and others. If one of these is altered, it likely will affect the others, usually adversely.

The EPA considers tampering as removing, disconnecting, damaging or in any way rendering ineffective any emission-control device or element of design installed on a vehicle. These include the engine items mentioned, plus the catalytic converter, air pump, vacuum lines and others.

EPA TO EASE RULES ON LEGALIZING EXOTICS

AUTOWEEK reports there's still hope for the true sports-car buff who has dreamed of owning a Ferrari Boxer or Lamborghini Countach without going through the lengthy and expensive federalization process.

The Environmental Protection Agency and the U.S. Customs Service are putting together a rules package that would permit a one-time exemption for individuals who wish to import uncertified vehicles without adding on the EPA-required pipes, cannisters and converters.

Only certain cars—the EPA hasn't specified which—will be allowed in under the exemption rules.

About 1,600 vehicles in this category have been imported so far. But under current rules, an importer bringing in an odd-ball, non-federalized car must spend thousands of dollars to bring the vehicle into compliance with federal safety and emission laws.

The idea behind the new rule is to lessen the hardship for some importers, for whom the required modifications might comprise a major burden.

Final rules are expected soon, according to the EPA.

POOR BEHAVIOR STRESSED AS ACCIDENT CAUSE

Transportation executive Mark D. Robeson told an audience of industry executives recently that the federal government has not focused sufficiently on poor driver behavior as a major cause of motor vehicle accidents. Instead, he said, "it devotes the greater percentage of its safety efforts to enforcement and standards and not to the predominant and yet unresolved problem of driver behavior."

Robeson was recently elected chairman of the Board of Directors of the National Safety Council.

His remarks were made in New York City after receiving the 1979 Seley Award from the Transportation Association of America for major contributions to safety in private enterprise transportation.

He noted that poor driver behavior accounts for 92 percent of safety problems in the transportation industry, but the federal government has not concentrated on this aspect of the accident problem, "perhaps because it is easier to set measurable standards for highway maintenance, for vehicle manufacture and for other matters, rather than establish and enforce standards of driver performance."

JOKE

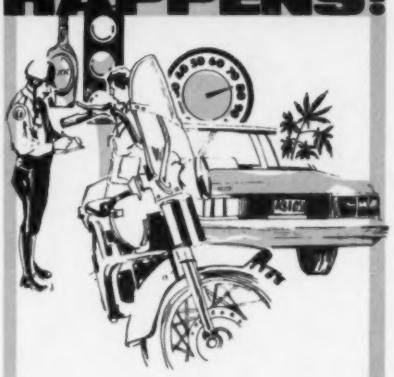
Major Manuel A. Conley, USA, won second prize in *The Military Intelligence* Magazine humor contest for this anecdote:

During a recent training exercise a message arrived at the XVIII Airborne Corps G2 section stating that with AWADS, a Special Forces detachment had been infiltrated by HALO, supplied by LAPES, and extracted by CAR. Most of us staff officers knew that AWADS translated to Adverse Weather Aerial Delivery System, HALO signified High-Altitude, Low-Opening parachute operations, and LAPES denoted a Low-Altitude Parachute Extraction System.

But what was CAR?

As the 1700 briefing neared, frantic inquiries were made, references searched, and a liaison officer summoned. Finally, with only seconds to spare, our newly assigned female enlisted clerk found the answer. She informed us that a CAR was a four-wheeled passenger vehicle propelled by an internal combustion engine—an *AUTOMOBILE*.

HOW IT HAPPENS!



A CLASSIC

It is noontime and a young servicemember borrows a friend's motorcycle to grab a hamburger at a local drive-in. The member has only a couple of months' experience with cycles, and none with this particular bike. He has learned what he knows about riding from his brother, and has never taken a motorcycle course.

He hops on the bike, donning a helmet but neglecting to fasten the strap. He takes off and is soon going over the speed limit. He loses control of the cycle on a curve and jumps a curb, losing the helemet in the process. He strikes a tree and suffers massive head injuries.

If we had to describe a "classic" (as in "typical") motorcycle accident, it would be very much like this: A new cycle rider, with limited experience and no formal motorcycle training. An unfamiliar (probably borrowed) machine. Too much speed. Helmet unfastened, or not worn.

Thus a young man's life is reduced to terse statistics:

"Immediate cause of death: Massive impact trauma to head. Contributing causes: Speed. Limited riding experience. . . ."

(left) **A difficult part** of the skill course for the larger bikes is passing in and out of the cones. (right) **Inches from the mark** is a good stop at 25 mph. The precision braking event tested the contestants' skill in coming to a controlled stop.

It's not TIME or SHOWMANSHIP

♪aloha♪VAROOOM!♪

by LESLIE S. OZAWA
NAS Barbers Point, HI

Photos by PH2 DENNIS SHEROD

Motorcycle enthusiasts know that there are many types of motorcycle rodeos. But one held recently at the Naval Air Station (NAS) Barbers Point, Hawaii emphasized safety.

Barbers Point, located on the sunny, southwestern coast of the island of Oahu, has perfect cycling weather most of the year. About 600 motorcycles are registered on the base, and a motorcycle safety course run by the air station safety office attracts a half-dozen riders monthly.

A core group from the NAS Safety Council thrashed out the plans for the safety motorcycle rodeo. Dave Sims, the NAS motorcycle safety course instructor, explained, "The emphasis was not on time or showmanship, but on smooth control of the bike."

Several designs for the rodeo course were considered, using the experience of several cycling enthusiasts. However, Sims finally decided to design his own rodeo course by adapting the skill tests he uses for his safety course. The skill tests are designed by the Motorcycle Safety Foundation.

"I took the proficiency tests and tied them all together, end to end," said Sims. "I thought the course might be too tight for the bigger bikes," observed Sims, "so I expanded it a bit."

The rodeo course finally adopted consisted of three events—a slow ride, a skill ride and a precision braking test. Competition was divided into two classes—410cc being the dividing point between small bikes and big bikes.

Scoring was based on a penalty system wherein those people accumulating the least number of points in all three events became the overall winners.

In the slow-ride event, a base score of 10 was given to every contestant. A cyclist had to travel 30 feet in 10 seconds. Since the object was to take as long as possible to cover the distance, one penalty point was added for each second the cyclist ran under the limit. On the other hand, for each second longer than 10 seconds the cyclist took, one point was subtracted from the base 10 points. Putting a foot down, knocking down a traffic cone course marker or stalling the engine added three points to the score.

In retrospect, Sims remarked that all of the bikers were skilled riders, and that a 20-foot course in 10 seconds would have been sufficient.

There was no base score for the skill event. This ride consisted of several hairpin and 90-degree turns, followed by a figure-8 loop and ending with a weaving sequence between a straight line of traffic cones. One point was given for every second elapsed time plus five points for putting a foot down,

(left) **On the proverbial dime** is where AMS Ed Ross of VP-22 stopped his Honda CX500 in the precision braking event. (right) **Eagerly awaiting** the start of the skill ride event, rodeo participants line up behind the starting line.

that counts, but SMOOOOTH CONTROL

knocking down a cone, stopping or crossing a course boundary.

In reviewing the event, Sims said that timing wasn't really necessary except as a tie-breaker. Penalty points for breaking the rules were substantial and it was better to get a "clean" but slow run than to hurry through the course knocking down cones.

Precision braking was one on a 205-foot course. The first 140 feet was used to accelerate to 25 mph. In the next 20 feet the rider stabilized the bike's speed. The cyclist then applied the brakes in an attempt to stop on a white line transversing the course 45 feet away. One penalty point was given for each inch the center of the front tire stopped before the line, or two points for each inch after the line.

To improve the braking course, Sims suggests a large "X" be used instead of the transverse straight line. This would give the cyclist a better view of the approach to the stopping line at the intersection of the "X."

At first entry was limited to active duty military personnel at Barbers Point. However, it was soon decided to open the rodeo to all military bikers on Oahu. For the next rodeo, Sims suggested that military dependents also be eligible, since they form a substantial portion of the air station's cycling population.

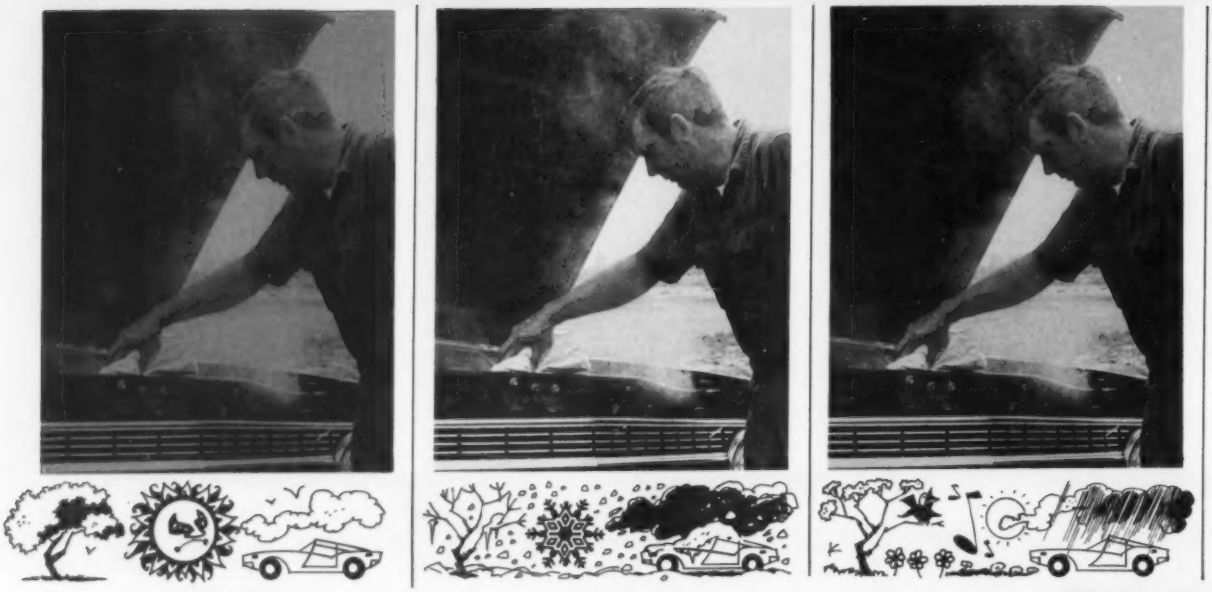
A motorcycle safety lecture started off the day's events. Then a Honolulu Police Department sergeant spoke about trends in motorcycle accidents on Oahu and explained various basic motorcycle safety practices.

Also planned for the day were displays by local motorcycle dealers and clubs. Several dealers generously donated gift certificates of substantial value as well as small bike accessories and parts discounts. The air station pizza vendor also donated pizza discounts.

While the rodeo hopefuls were listening to the speaker at the station theater, 260 traffic cones were put down on the chalked-in spots that had been marked the night before. After the lecture, the bikers gathered at the site and the motorcycles were first given a safety inspection. Lights, horns, blinkers, tire tread wear, mirrors, and chain and cable wear were checked. Then the course rules were explained and the riders were walked through the skill ride course.

Each contestant had two runs through each event. Their scores for the two runs were averaged to compute their event points.

Although the crowd wasn't huge, you wouldn't have guessed that from the enthusiastic cheering and clapping at the awards ceremony.



cooling systems for ALL

Radiators aren't just for summer; anti-freeze isn't just for winter

Discussing cooling systems in August is not as crazy as it might seem. For every reader in a hot climate saying that it is a little too late to be talking about coolants, there is another reader in a cooler area saying that it is too early to be mentioning anti-freeze. The truth is cooling systems work hard year around.

With internal combustion temperatures reaching 4,500 degrees Fahrenheit it is easy to see the need for a good cooling system. An engine would quickly destroy itself as lubricated parts such as pistons exceed 400 degrees if something didn't dissipate the heat.

Most cars circulate liquid around the cylinders and heads to conduct heat away from the engine. (Yes, Wolfgang, some engines are air cooled, but with increased emphasis on noise pollution there are fewer and fewer every year.) Once the liquid has circulated in the engine block picking up all the heat it can, it is pumped from the engine into the radiator. At the radiator, air moving past the core because of the vehicle's speed draws the heat out of the liquid, helped by a fan. The cooled liquid is then returned to the engine to repeat the cycle.

The liquid in the cooling system should be at least half anti-freeze and half water. Ethylene glycol-based anti-freezes mixed with equal parts of water raise the boiling temperature of the liquid from 212 degrees to 227 degrees at sea level. The ideal two-thirds, one-third ratio lifts the boiling point to 238 degrees. At the other end of the scale, equal parts of anti-freeze and water won't form ice until 34 degrees below zero, compared to water's freezing temperature of 32 degrees above. The maximum ratio of two parts anti-freeze and one part water doesn't turn solid until 92 degrees below zero.

Now for some good news and bad news. First the bad news: your temperature warning light will probably not come on until the coolant reaches 250 degrees. Fortunately (this is the good news), cooling systems are pressurized which raises the boiling temperature even higher. With 15 pounds per square inch (psi), the boiling point is raised 37 degrees. Therefore, the normal cooling system with a 50 percent solution of anti-freeze and water at 15 psi has a boiling temperature of 264 degrees at sea level.

We mention sea level because the higher above it the vehicle is, the lower the boiling temperature. For example, water boils at 212 degrees at sea level, while at 5,000 feet it boils at 202 degrees. Should you be crossing the Continental Divide, the boiling temperature of water would be approaching 184 degrees.

Are you ready for some more good news-bad news? The good news is that today's anti-freezes (which should actually be called coolants) also inhibit rust as well as lubricate the water

seasons

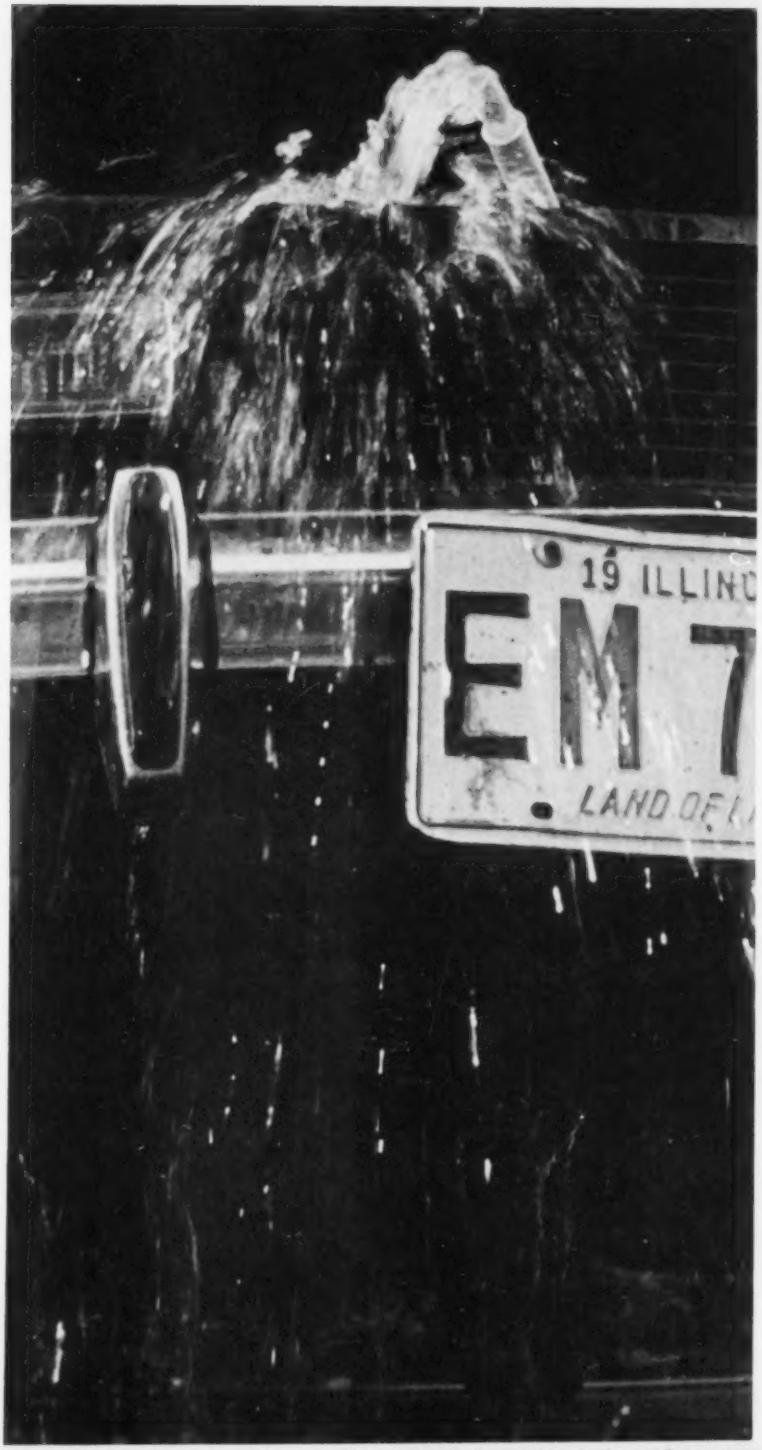
pump. The bad news is that coolants lose their potency and have to be replaced periodically. But there's more good news: this annual spring drain, flush and replenish of the coolant is the most productive cooling system maintenance. But let's not drain, flush and refill until the entire system is in peak condition.

Proper cooling system preventive maintenance starts with keeping the coolant level correct. HEY, WAKE UP! CHECK THE RADIATOR LEVEL AT LEAST MONTHLY!

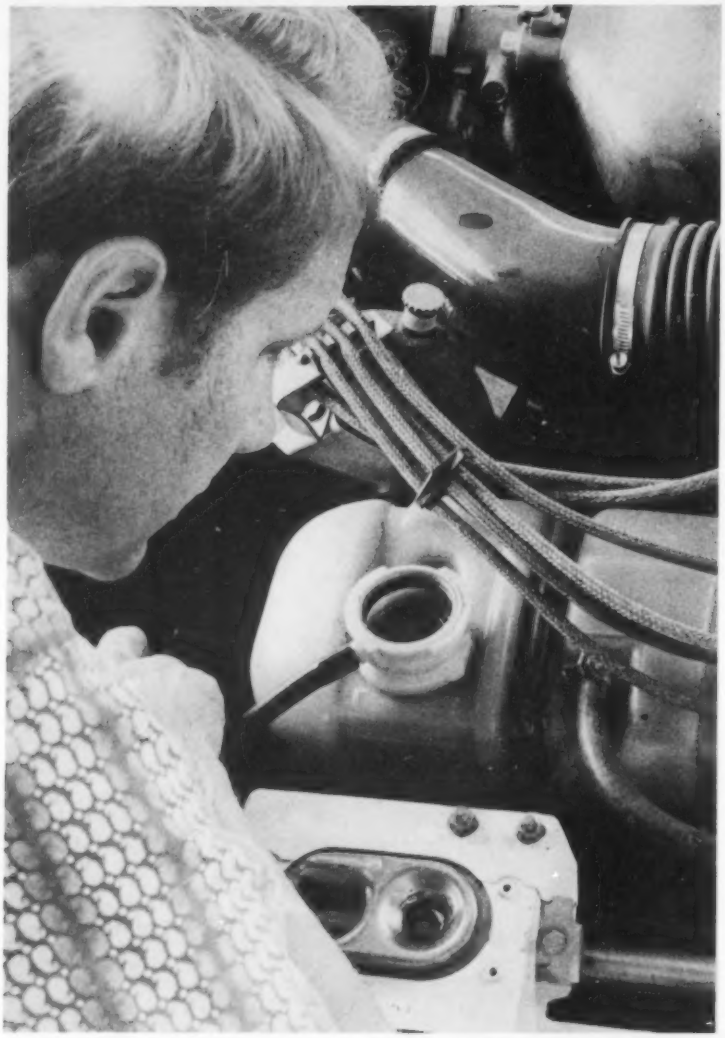
If the coolant level is too low there may not be proper circulation at low engine speeds and at high speeds too much air will be mixed with the liquid. The air bubbles not only reduce coolant capacity but also promote rust, corrosion, foaming and further coolant loss. No matter how you look at it, a coolant shortage can quickly become overheating—even in the winter.

Overfilling the radiator can be just

continued



The annual spring drain, flush and refill of coolant is the most productive cooling system maintenance.



Proper cooling system preventive maintenance starts with keeping the coolant level correct. When was the last time you checked yours?

as bad as not filling it enough. Done continually, you will not be able to judge the system's condition. Overfilled systems don't have enough air space left to allow for expansion of the heated coolant, which must then be dumped out the overflow. And it is the anti-freeze that gets dumped, not the water.

As the coolant level rises and falls with engine temperature, check the radiator level at the minimum safe operating temperature. Then, if the system is clean, leak-proof and in proper working order, very little water should be lost. Therefore, any adding of large amounts of water indicate a developing problem.

Of course there are other signs of leaking. When the coolant is cold, small leaks may show dampness or even dripping. However, when the coolant is hot, rapid evaporation removes any trace of dampness. When examining the cooling system look for rusty or grayish-white stains as leak indicators.

The vast majority of coolant leaks and subsequent overheatings result from defective radiator pressure caps. Therefore, the radiator pressure cap should be checked at least twice a year or every 7,500 miles. Begin the check by examining the cap for bent tangs and its gasket for cracks or brittleness. Press the cap's spring; if there is not a very strong resistance, replace the cap.

If you have access to a cooling system analyzer – often found at installation auto hobby centers – make full use of it. Wash the radiator pressure cap and attach it to the analyzer. Pump up the pressure until the analyzer indicates the psi stamped on the radiator cap body. If that pressure is not maintained for at least 30 seconds, replace the cap. If all the pressure bleeds off in less than five minutes, you need a new cap also.

Regardless of the cap's condition, it should be replaced every three years or 40,000 miles in a good preventive maintenance program.

As long as you have your hands on a pressure analyzer, do a complete system check. After wiping the filler neck clean, inspect it for bent parts and cracks. If the neck is damaged it should be cut off and replaced at a radiator shop. Next, remove the overflow tube and check it. Push a wire through the tube to clear any obstructions, being careful not to punch a hole in the tube. If the tube is not in good condition, replace it.

Following the cooling system analyzer instructions, attach it to the filler neck and pump the unit to 15 psi. Immediately check upper and lower radiator hoses. Any bulges indicate weak hoses which must be replaced. Slowly dropping pressure means there is a small leak somewhere. A flashlight will help you locate telltale seepage, but you may have to feel for dampness in those areas you can't see.

Rapidly dropping pressure is the sign of a major external leak which you should be able to find easily. However, if you don't find an external leak, you'll need to run other tests to uncover an internal one. After running the engine a couple of minutes with the radiator cap in place, turn it off and pull the oil dipstick. Oil that looks white or has actual water globules in it may indicate an internal crack. If your vehicle has an automatic transmission, pull the dipstick from it. A low automatic transmission fluid (ATF) level or water in the ATF point to a leak between the transmission oil cooler and the radiator.

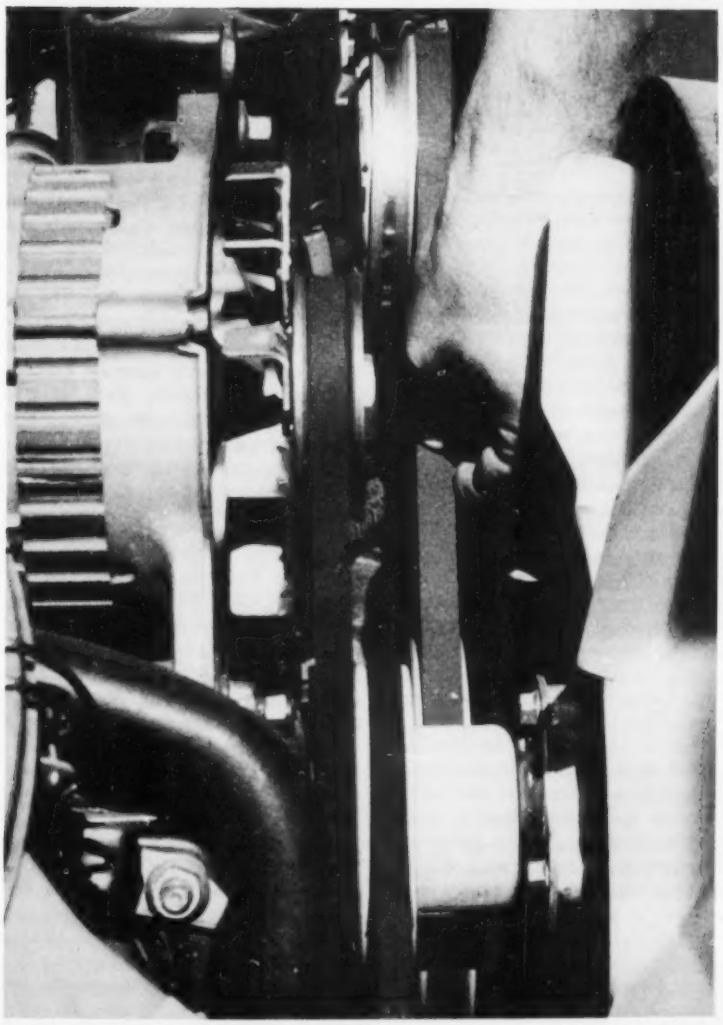
The final test is for a leaking head gasket. Warm the engine until the thermostat opens (squeeze the upper radiator hose and you'll feel the coolant rush through the hose when the thermostat opens) and then turn it off.

After very carefully removing the radiator cap, attach the analyzer and pump in seven or so psi. Now restart the engine and race it. Should the analyzer needle fluctuate the head gasket is blown. If you suspect a damaged head gasket and don't have an analyzer, put the overflow tube into some water. If the water bubbles when the engine is running with the radiator cap in place, you have head gasket trouble.

These radiator pressure checks are also good semi-annual preventive maintenance. At the very least such tests

continued

Squeezing hoses is a regular part of the semi-annual cooling system checkup.



Drive belts should have a quarter to a half-inch of play when pressed between pulleys.

OH, OH-H-H-H, THAT SMARTS!

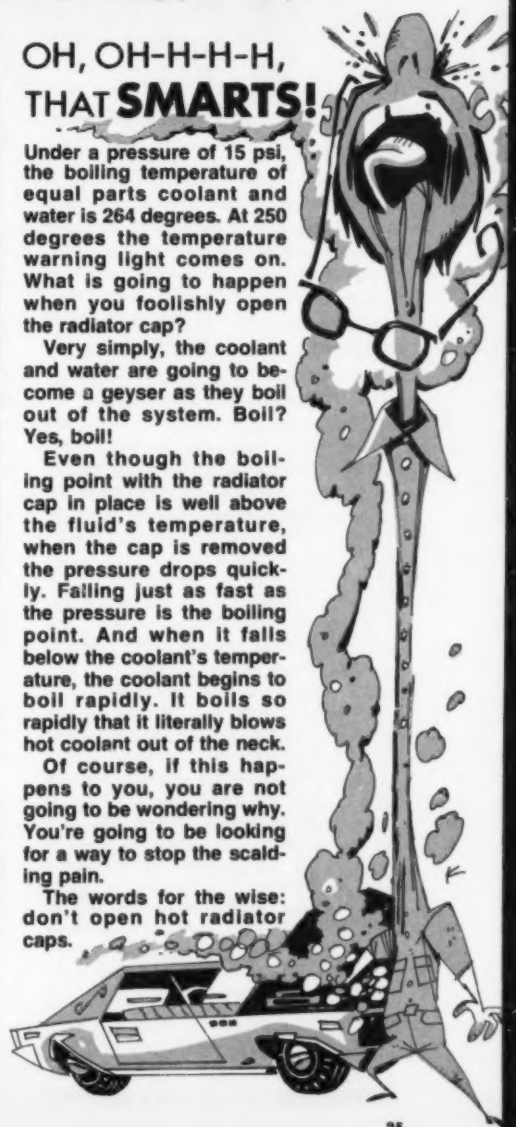
Under a pressure of 15 psi, the boiling temperature of equal parts coolant and water is 264 degrees. At 250 degrees the temperature warning light comes on. What is going to happen when you foolishly open the radiator cap?

Very simply, the coolant and water are going to become a geyser as they boil out of the system. Boil? Yes, boil!

Even though the boiling point with the radiator cap in place is well above the fluid's temperature, when the cap is removed the pressure drops quickly. Falling just as fast as the pressure is the boiling point. And when it falls below the coolant's temperature, the coolant begins to boil rapidly. It boils so rapidly that it literally blows hot coolant out of the neck.

Of course, if this happens to you, you are not going to be wondering why. You're going to be looking for a way to stop the scalding pain.

The words for the wise: don't open hot radiator caps.



Quiz: What's missing from this emergency cooling system kit? There's a spare belt, radiator cap, roll of tape, wrench, rag and a gallon of water. The spare hose clamp is the missing item.

should be conducted before the annual spring drain, flush and refill. And they should always be done when parts of the cooling systems have been replaced as a final check.

Some small leaks can be cured with stop-leak compounds, but not those that involve the pressures and heat of the combustion chamber such as around the head or head gasket. In any case, after adding a stop-leak compound, drive the car several miles and reexamine the suspect area.

Another part of the semi-annual cooling system checkup includes all hoses. Squeeze all radiator and heater hoses firmly. Any that feel mushy or extremely brittle should be replaced. Look carefully for signs of splits while squeezing, as they have a nasty habit of bursting wide open under pressure. And don't forget the small bypass hoses between the water pump and block on some models.

Pay extra attention to the lower radiator hose. This hose is lined with a coiled wire to keep it from collapsing. If this wire loses tension, the hose may partially collapse at high speed and restrict coolant flow to produce a very elusive overheating problem.

Regardless of their condition, replace all hoses at least every third year or 40,000 miles. Us only those hoses designed for your vehicle as the universal or flexible hoses may restrict coolant flow. Keep in mind that installing only one or two new hoses may increase the system's pressure causing older hoses to burst under the strain.

Before installing a new hose, clean the connection with a wire brush and coat the surface with a sealing compound. Place the new clamps (don't reuse old spring-type clamps no matter how good they look) on each end of the hose before positioning the hose. Once the hose is in place, slide the clamps to about a quarter-inch from the end of the hose for the best position on the fitting. Tighten the clamp just short of cutting into the hose.

All drive belts should be checked every six months, too. Replace any belt that shows wear, is cracked or glazed on the inside. Belt tension should be adjusted with a gauge. If you don't have a belt tension gauge, adjust the belt until there is about a quarter to a half-inch of play when pressed between pulleys. Overtight belts can cause serious problems, too.

Drive belts should be replaced every two years or 30,000 miles as an inexpensive step toward preventive maintenance.

As mentioned earlier, the most productive preventive maintenance is the annual drain, flush and refill of the coolant. There are two methods of draining and flushing. The old one requires opening all drain plugs on a hot engine and attempting to flush rust and sludge out with a hose. As you may have already guessed this is a good way to get burned. The new "hassle-free" system begins with buying a flushing kit for about $2. Following the kit's instructions results in about five minutes spent to install the kit and completely flush the system. Don't forget to close all the drains and reconnect all hoses before beginning to refill the system.

Once you have decided on the ratio of coolant and water you intend to use, you can begin to refill the cooling system. Put in half the water first. (If you did forget to close or reconnect something, or if you have a leak, all you'll be losing is water.) Then add the amount of coolant necessary to produce the finished ratio of coolant to water. Now finish filling the system with water. Be sure to leave enough room for expansion. Start and run the engine until the thermostat opens. This allows the solution to mix, and once the thermostat opens, releases any air trapped in the block. Now check the entire system for leaks (you may want to put the analyzer on again) and recheck the coolant level before driving the car.

Timely preventive maintenance should avert problems with hot cars, warped engines, hot tempers and expensive towing. But it's a good idea to have a few items in the trunk for emergencies. Always carry spare belts and the tools to install them. While radiator hoses shouldn't give you any problems (if you check and change them regularly) a roll of tape and a few spare hose clamps can be useful for temporarily sealing small leaks or reinstalling popped hoses. A gallon of water is an excellet idea—if not for your vehicle, then for the other poor soul who doesn't read and follow the Backyard Mechanic. A few rags can protect hands while working with hot cooling system parts or be stuffed into the radiator filler neck to temporarily replace a blown radiator cap.

However, the best advice is still to check the coolant level frequently.

misconceptions about tires

Some 140 million licensed drivers in America use tires, but most don't use them efficiently. There are some common misconceptions about tires, even among many sophisticated drivers. Some typical misconceptions:

■ **The best place to check tire air pressure is at your service station.** Wrong, unless you live less than a mile away. Air pressure should be checked with a gauge when your tires are "cold" – that is, when they have been driven a mile or less or if they have been idle for at least three hours. A good time for such a check is in the morning at home with your own gauge before driving. Then, at your service station, sufficient air should be added to make up the difference between your pressure reading at home and recommended pressure – after taking another reading now that the tires are warm. For example, if pressure at home was 24 pounds compared with a recommendation of 32, your tires are eight pounds underinflated. If a new reading of the warm tires at the service station indicates a pressure of 28 pounds, for example, the tires should be inflated to 36 pounds to correct the underinflation.

■ **Air pressure should be checked just when your car is serviced.** Wrong, because air pressure should be checked at least monthly, and few private cars are serviced that often. In typical use, tires "exhale" up to a pound of air a month. Monthly checks can catch slow leaks before they cause trouble at an inconvenient time or place.

■ **The air pressure for your tires indicated in the owner's manual for your car provides optimum performance in every respect.** Not necessarily. The tire industry has converted to metric sizes, and new metric-sized radials for passenger cars are built for air pressures up to 35 pounds. For optimum fuel efficiency, metric-sized radial tires on newer-model cars (which generally have suspension systems designed for higher-pressure tires) should be inflated to the maximum indicated on the tire sidewall. Maximum air pressure reduces tire rolling resistance, which in turn improves gas mileage because five to 10 percent of the fuel consumed by a car engine is used to overcome tire rolling resistance.

■ **Some air should be released during the winter to improve traction.** Wrong. Lower air pressure does not improve traction. Lower air pressure increases fuel consumption and causes excessive tread wear. Tires lose a pound of pressure for every 10 degrees drop in temperature. Therefore, frequent tire checks are recommended during the winter.

■ **Some air should be released in the summer before extended highway driving to prevent overheating.** Also wrong. A properly inflated tire will not overheat unless driven at excessive speeds. In fact, releasing air can cause dangerous tire overheating that could result in a blowout. Besides, lower air pressure increases fuel consumption and causes excessive tire wear in the summer just as it does in the winter.

■ **Radials ride harder than bias-ply tires.** Radials ride smoother than bias-ply at highway speeds as well as at speeds typical of most city driving. They may be somewhat harder riding only at speeds below 20 miles per hour.

■ **Radials eliminate the necessity for snow tires.** Not in snow regions. Radials offer better traction than bias-ply tires but snow tires are still best in snow accumulations of two inches or more.

■ **Bias-ply tires can be mixed with radials as long as they're on the same axle.** Not recommended but acceptable if the bias-ply tires are installed on the front axle. Never acceptable if the bias-ply tires are to be installed on the rear axle. Because of inherent handling characteristics, a mix of rear bias-ply tires and front radials can endanger safety in quick reaction situations, even on front-wheel-drive cars. Thus, rear bias-ply snows should never be used with front radial tires.

■ **Snow tires belong on the rear axle of front-wheel drive cars.** Wrong. Snow tires for front-wheel-drive cars should be mounted on the front axle where they can help pull the car through the snow.

■ **Radial tires need not be rotated.** Rotation of radials – from front to back and back to front on the same side of the car rather than diagonally – is recommended for most drivers. It evens out wear. However, a car owner with good driving and car maintenance habits may be able to omit rotation, if periodic tire checks indicate no uneven wear. Keeping wheels properly aligned and tires properly balanced helps avoid uneven wear.

■ **Wheel balance should be checked periodically.** "Checking" balance requires almost as much labor as balancing itself, so that checking wheel balance is impractical. As tires wear down, balance can change. Wheels should be rebalanced when noticeable vibration occurs on smooth roads. If balancing doesn't correct the vibration, something else in the car is the cause. One advantage in mounting snow tires on their own wheels is that the need for future wheel balances is usually eliminated. When snow tires are demounted and replaced with regular tires, the wheels should be rebalanced. In fact, balancing is needed whenever a different tire is mounted on a wheel.

Proper air pressure is the fundamental secret of good tire maintenance. Air supports car and passenger weight. Insufficient air overheats tires and increases rolling resistance. Heat deteriorates tires. High rolling resistance decreases fuel efficiency ⊕

Firestone Tire and Rubber Company

DRIVER

THE
TRAFFIC SAFETY MAGAZINE
FOR THE MILITARY DRIVER

DEPARTMENT OF THE AIR FORCE
HQ AIR FORCE INSPECTION AND SAFETY CENTER
Norton Air Force Base, California 92409

HON HANS M. MARK
Secretary of the Air Force

Lt Gen HOWARD W. LEAF
The Inspector General, USAF

Maj Gen LEN C. RUSSELL
Commander
Air Force Inspection and Safety Center

Col LELAND K. LUKENS
Director
Aerospace Safety USAF

PUBLISHED MONTHLY IN COOPERATION
WITH
THE DEPARTMENT OF THE ARMY
AND
THE DEPARTMENT OF THE NAVY

Dr. FRANCIS S. McGLADE
Director of Safety
United States Army

RADM W. B. WARWICK
Commander
Naval Safety Center

AFRP 127-1
Controlled circulation entered
at Santa Ana, CA USPS 448-630

Authority to publish this periodical automatically expires on 29 January 1982 unless its continuance is authorized by the approving authority prior to that date.

SUBSCRIPTION—DRIVER is available on subscription for $12.00 per year domestic ($1.00 per copy); $15.00 per year for foreign mailing ($1.25 per copy), through the Superintendent of Documents, Government Printing Office, Washington, D.C. 20402. Back issues are not available. Changes in subscription mailings should be sent to the above address. Use of funds for printing this publication has been approved by Headquarters, United States Air Force, Department of Defense, Washington, D.C. No payment can be made for manuscripts submitted for publication. Contributions are welcomed, as are comments and criticism. Address all correspondence to the Editor, DRIVER Magazine, HQ AFISC/SEDD, Norton AFB, CA 92409.

Distribution. One copy for every 9 members of USAF.

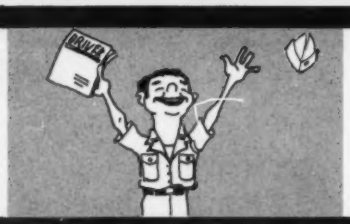
ATTENTION DEPT OF THE NAVY PERSONNEL: Address all queries concerning distribution to NAVSAFECEN, NAS, NORFOLK, VA 23511, Attn: Safety Publications Dept. All other correspondence will be welcomed by the Editor.

The contents of this magazine are informative and should not be construed as regulations, technical orders, or directives unless stated. Address reprint requests, stating intended use of material, to the Editor. The Editor reserves the right to make any editorial changes in manuscripts which will improve the material without altering the intended meaning.

The inclusion of names of any specific commercial product, commodity, or service in this publication is for information purposes only and does not imply endorsement by the Air Force.

Certain individuals shown in this magazine are not members of the Air Force and therefore do not conform to Air Force grooming standards.

BACKfire
LETTERS to the EDITOR



PLAUDITS

My hat's off to DRIVER Magazine! As a car buff, I have been reading DRIVER for about three years now and I find it to be one of the most informative magazines on the market regarding car safety and car care. It's easily readable and most articles are structured so as to be readily comprehendable. Undoubtedly, it has contributed to the education of many of our young service personnel who uniformly find it a must in reading, especially if they care for their motor vehicle (and most do) and their own personal welfare.

Keep up the good work! You're publishing a quality product as well as performing a valuable service to our Navy/Air Force military personnel.

Capt Joseph R. Bondi, USN
2155 Veenendaal Court
Herndon, VA 22070

Thank you. (Army gets DRIVER, too.)

ACCIDENTS AND LITERACY

In reading your magazine of May '80, I found a point in the "Timely Topics" that I thought should be made. The topic being "Accidents and Literacy" discussed the higher number of auto accidents that illiterate people have compared to literate.

The study suggested that the reasons for the increased number of accidents may not be due entirely to the person being unable to read, but also from their "socioeconomic" class. I believe these are related, because by learning to read it would or could improve the person's socioeconomic class as well as improve their driving.

I certainly wouldn't want to be behind the guy who stops in the middle of the road to try to read a sign "Road Detour—Take route north around Atlanta, local traffic get off next left." How about the same person trying to find a street in the city, stopping at EVERY intersection trying to read the signs?

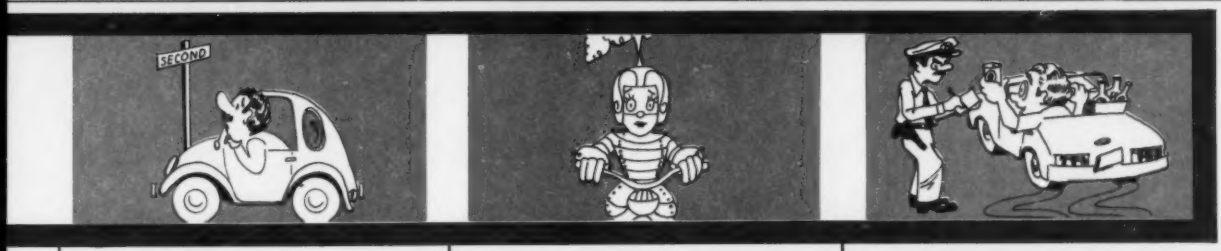
These people would benefit in many other areas besides driving if they would learn to read. I'm sure there are thousands of fantastic minds that are locked closed because these people cannot read. I think it would make much more sense to require literacy before issuing driver's licenses rather than adapt the International Road Signs to promote putting more of these people on the road.

By issuing licenses and providing signs for these illiterates, we are also doing nothing to help the people themselves—other than to put less than capable people behind the wheel. By requiring literacy the people would see that they cannot "slide" by in this world without an education. Society is too complex to get by without basic skills.

I am disappointed that DRIVER would let it pass and condone illiterate people driving and "help" them by use of the international road signs. These signs have their purpose. Your implication is not one of them. Teach them to read and we'll all be much better off.

GMT2 C. Erickson, USN
WA Div
USS DALE CG-29
FPO Miami 34090

Erickson refers to a study done by Dr. P.F. Waller at the University of North Carolina which reports that drivers who could read well enough to take a written licensing exam (and were thus examined orally) had 24% more accidents in which they were at fault than did drivers who could read well enough to take the written exam. (Waller says literacy may not be the direct cause.) When our society really believes driving is a privilege and not a right, these factors may carry some weight. Now they simply do not.



MOTORCYCLES

DRIVER Magazine devotes a great deal of space to the operation of motorcycles and, although I do not operate one, I can well appreciate the need to emphasize problems associated with the operation of such vulnerable vehicles.

I note that a good deal of the comments regarding motorcycles involve whether it is appropriate for states to legislate the use of safety equipment, most notably helmets. It appears that a good deal of the correspondence in the "Backfire" section was critical of such legislation but, as an insurance underwriter of some years, let me contribute the following:

On approximately $50,000,000 of written automobile premiums covering four-wheel vehicles, we had a total of 111 accidents with dollar reserves or payments in excess of $10,000. Of the 111, 17 or 15.3% involved automobiles vs. motorcycles with a total dollar reserve of $804,000 which is an average of $47,294 each.

Four of the 17 resulted in fatalities, two involved dismemberment of limbs, and one, the loss of an eye—all to the motorcycle operators. None of the cases produced fatalities or serious injury to the occupants of the four-wheel vehicles.

Seven of the 17 involved the automobile making a left turn in traffic and, in each case, the car operator claimed that the vehicle was not observed until just before impact. Based on the initial accident description, fault or legal responsibility for the accident is 60% car and 40% motorcycle.

Information as to how many motorcycle operators were wearing protective helmets and clothing, whether or not the wearing of such mitigated the injuries sustained was not available. However, these facts do bear out Mr. Guy McAllister's (October '79) statement that the bottom line is the cyclist loses 100% of the cars vs. cycle accidents. Helmet laws or not, common sense dictates that the cyclist needs all the help he or she can get.

Mr. Bruce C. Walling
General Accident Group
414 Walnut Street
Philadelphia, PA 19105

"WHEN YOU'RE STOPPED BY POLICE"

Your article "When You're Stopped by Police" (June '80) is an excellent one with one exception. You state that if the person is arrested his vehicle cannot be searched, but that a handbag or container can. According to a recent Supreme Court decision, it is legal for the arresting officer to conduct a search of the area that was within the immediate control of the individual incident to his arrest; this includes, but is not limited to, the front seat, the glove box, and the rear seat of the vehicle and any container in that area as long as the arrestee is present.

SrA John H. Wiles Jr., USAF
PSC Box 288
Hurlburt Field, FL 32544

We were not speaking of an "arresting Officer" because you are not going to be arrested for committing a traffic offense. Therefore neither you nor your car should be searched. If the driver has committed a misdemeanor (such as reckless driving) he may be arrested. If he has committed a felony (such as having an accident while drunk) he will be arrested. In such cases the officer may frisk the driver and look for concealed weapons in the interior of the car. If the driver is drunk and the officer sees open alcohol containers, he is not expected to overlook that fact. Nevertheless, his right to search is limited by law. Most of our readers have no need to worry about misdemeanor or felony arrest.

CURT TESTY

I'm writing in reference to your June Trivia questions. The quiz was great, but on the first question, "What manufacturer offered air conditioning as an option first?", the answer was incorrect. Chrysler offered optional air conditioning on their Imperial in 1931.

Cpl Michael J. Smith
MACG-48 F/L
NAS Glenview, IL 60026

Herumph! Gawww-leee, Mike, one of two things has happened. First, maybe you've seen a very professional installation job and thought it was a factory option. Or, like so many other early options, air conditioning was offered by Chrysler on their 1931 Imperial and the response was sooo bad, they forgot the whole idea and hoped the rest of the world would too. In either case, thanks for the good words; but raspberries to you for arguing with Testy –he's curt enough already.

PROTECTIVE CLOTHING

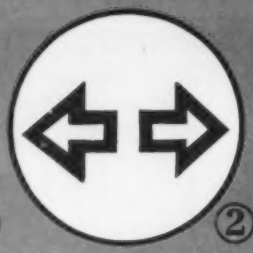
I just finished reading the May issue of DRIVER Magazine. In reading the article "Get Into Gear . . . Get It on," I refer to the caption on page 10, "And she was the Terror of highway 101." Leathers, while providing outstanding skin protection, good looks and wind protection are not the best in cold weather riding wear. Leather is not warm.

On page 11 your silent friend is not doing all he can to protect his hide. I realize hide is a term for skin, but your friend has no crash helmet on.

AO1 Lewis T. Ross, USN
VS-38 QA
FPO San Francisco 96601

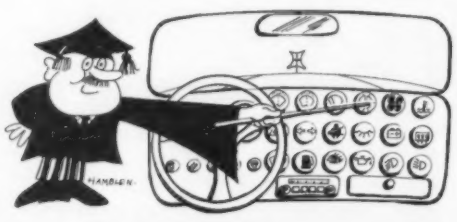
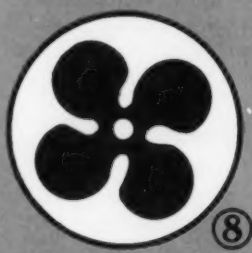
Our "silent friend" is a store mannequin–a real dummy!

☆U.S. GOVERNMENT PRINTING OFFICE: 1980—683-215/9



WORDLESS DASHBOARD ... signs

The 15 symbols shown here will be mandatory on 1981 American-made automobiles. General Motors is already using them on the X-body cars, and foreign car builders have been using these and other symbols for some time. All the symbols have been approved by the Internation Standards Organization which designed the wordless road signs now used on highways throughout the world.

Did you have any trouble telling what they mean?

1. headlamp switch
2. directional signal
3. hazard warning flasher
4. seat belt
5. fuel
6. windshield defogger
7. rear defogger
8. ventilating fan
9. clearance lights
10. windshield wiper
11. windshield washer
12. windshield wiper and washer
13. oil
14. battery charge condition
15. engine coolant temperature